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TEMPORARY NATIONAL ECONOMIC COMMITTEE

A STUDY MADE FOR THE TEMPORARY NATIONAL ECONOMIC COMMITTEE, SEVENTY-SIXTH CONGRESS, THIRD SESSION, PURSUANT TO PUBLIC RESOLUTION No. 113 (SEVENTY-FIFTH CONGRESS), AUTHORIZING AND DIRECTING A SELECT COMMITTEE TO MAKE A FULL AND COMPLETE STUDY AND INVESTIGATION WITH RESPECT TO THE CONCENTRATION OF ECONOMIC POWER IN, AND FINANCIAL CONTROL OVER, PRODUCTION AND DISTRIBUTION OF GOODS AND SERVICES

MONOGRAPH No. 39

CONTROL OF THE PETROLEUM INDUSTRY BY MAJOR OIL COMPANIES

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DEPARTMENT OF JUSTICE,
Washington, January 15, 1941.

Hon. JOSEPH C. O'MAHONEY,
Chairman, Temporary National Economic Committee,
Washington, D. C.

MY DEAR SENATOR: I have the honor to transmit herewith a study entitled "Control of the Petroleum Industry by Major Oil Companies" by Mr. Roy C. Cook, a member of my staff. This report originated and was completed by Mr. Cook as a private research project in the Department of Economics of The George Washington University. It is worthy of submission to the committee as a definite contribution to the hearings and literature on The petroleum industry. The author's background and research experience, especially in connection with the work of this committee, has fitted him to prepare this short but informative report on an industry so important to our national economy.

Mr. Cook has prepared this report, based upon public and privately published sources, independently of his official duties as a member of the economic staff of the Department of Justice. The facts, opinions, and conclusions are solely those of the author and are not to be considered as the opinions or policies of the Department of Justice.

Respectfully submitted.

THURMAN ARNOLD,
Assistant Attorney General.

PREFACE

The object of this study is to examine the more important monopolistic conditions which prevail in the petroleum industry. The analysis will be devoted primarily to the controls and economic power which the major oil companies exert over independent, nonintegrated oil companies. Most of us are fairly familiar with the story of the Standard Oil Trust which was dissolved by the Supreme Court in 1911, so that little attention will be given to this, except in the way of a few comparisons. The control of the industry by the major oil companies appears to be just as complete today as was the case of the Standard Oil Trust under Rockefeller. However, the methods of control are somewhat different today.

Even though the 20 major oil companies are separate corporate entities, there is definite evidence of cooperation among them and uniform concerted action by the adoption of identical business policies which has the effect of group monopoly. The American Petroleum Institute through its various committees makes their policy toward group monopoly more effective. The position of the independent oil companies has been gradually becoming weaker during the past 10 or 15 years, so that the opportunity for independent capital today is not at all promising, despite the continued and progressive growth of the petroleum industry. The advantages of full integration which the majors enjoy and their virtual control over transportation facilities give them distinct competitive advantages.

Although State and Federal programs have been adopted to prorate and regulate crude oil production in the name of conservation, the price considerations used in proration have usually favored the majors rather than the independents.

It is hoped that this study will present the problems that face the independent today and what considerations a new investor should bear in mind before going into the industry. The consumer aspect of the problem of the major's control of the industry is not developed in this survey. Instead, it will be developed from the point of view of the independent oil man. Since the majors are fully integrated and engage in all activities from the wells to the consumer, the analysis of the controls will be made for each of the four divisions of the industry insofar as this is practicable.

The tables and charts contained in the appendix have been reproduced, without change by the author, from the record of the Hearings before the Temporary National Economic Committee on the Petroleum Industry, September 25 to October 25, 1939.[1] It is believed that the material in this appendix has a definite bearing on the problems in the petroleum industry and supplements the tables appearing in the text.

This study originated and was completed as a research project in the Department of Economics of The George Washington University in 1940. In this connection the author wishes to express his appreciation to Dr. Donald S. Watson for his helpful suggestions and constructive criticism of the text.

[1] Hearings, Parts 14, 14-A, 15, 15-A, 16, 17, and 17-A.

CHAPTER I

INTRODUCTION

The American petroleum industry is composed of 4 divisions—namely, production, transportation, refining, and marketing. The petroleum industry is the largest in the industrial group as measured by invested capital and ranks next below each of the broad classifications of agriculture, railroads, and public utilities. The 17 largest industrial corporations in terms of their total assets on December 31, 1939, included 9 oil corporations.[1] One of the main characteristics of the industry is that of full integration, and there is no relatively large company today which is not fully integrated, although a balance of the 4 divisions does not always exist. The economic structure of the industry has been dominated by the fact of mass producion in refining. Vast networks of crude-oil and gasoline pipe lines and large ocean-going tankers, controlled jointly and individually by major oil companies, have been a vital factor in developing the large oil enterprises.

The total amount of capital invested in the industry at the end of 1939 was estimated to be about 15 billions of dollars, compared with 6½ billions invested in 1921, indicating the very rapid expansion of the industry.[2] For 1938 the estimated total retail value of gasoline was 2½ billions of dollars, while the total sales of all petroleum products was about 5 billions. The number of workers in 1939 was about 800,000. In addition there were an estimated 182,000 engaged in indirect retail outlets for petroleum products, such as garages, parking lots, and country stores.[3]

Some idea of the distribution of labor and capital may be seen from table 1. It is to be noted that the production division had 43 percent of the capital invested in the industry as compared with only 13 percent for the marketing division, which, however, accounts for 64 percent of the total employment in the industry.

TABLE 1.—*Percentage distribution of employment and invested capital by divisions of the petroleum industry in 1937*

Division	Employment [1]	Invested capital [2]
Production	18	43
Transportation	5	17
Refining	13	27
Marketing	64	13
Total	100	100

[1] American Petroleum Institute, Petroleum Facts and Figures, New York, 1939, p. 146.
[2] American Petroleum Industries Committee Taxation Bulletin, vol. III, No. 8, Nov. 28, 1938, pp. 2706-2774.

[1] Moody's, Manual of Industrial Investments, New York, 1940.
[2] Standard Statistics, Inc., The Petroleum Industry, New York, February 1940; see appendix, table 2 p. 57.
[3] American Petroleum Institute, Petroleum Facts and Figures, New York, 1939, p. 146.

The petroleum industry dates from 1859 with the discovery of the Drake well in Pennsylvania. However, the intensive growth of the petroleum industry has taken place since the early twenties, being closely coordinated with the accompanying growth of the automobile industry.[4] Gasoline became the most important product of petroleum, whereas in the days of the Standard Oil Trust kerosene was the principal product. Improvements in refinery processes have made it possible to recover approximately twice as much gasoline from crude oil as was the case in 1920. The consumption of gasoline has more than doubled since 1925.[5] In 1911 crude oil production was 220,000,000 barrels as compared with 1,214,000,000 barrels in 1938, which indicates the size of the industry at the time of the dissolution decree and today.[6]

The so-called Standard Oil trust controlled the industry through the monopolization of the refining and transportation branches, thus acquiring its independent competitors. The Supreme Court of the United States in 1911 disintegrated the trust into 33 companies. From these and other large financial interests, including those controlled by the Mellons and the House of Morgan, developed 20 major oil companies whose large aggregation of capital and identical policies make it easier for them to control the industry so that there is little opportunity for the small nonintegrated company to survive.

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[4] Appendix, chart I and table 1, pp. 57–58.
[5] Idem.
[6] Idem.

CHAPTER II

BASIC FACTORS

THE EXTENT OF CORPORATE CONTROL

The 20 major oil companies considered in this analysis had at the end of 1939 combined total assets of about 9 billion dollars, ranging in size from 62 to 2,035 million dollars, which is by far the largest of any group of corporations classified on an industry basis. Table 2, below, gives the correct corporate name of the 20 major oil companies and their total assets at the end of 1939. This group represents about 60 percent of the investment in the industry, but their degree of control of the industry is very much higher than this percentage indicates. Collectively, these corporations own or control through stock ownership 405 subsidiary companies operating in the United States; by far the greatest number belong to Standard Oil Co. (New Jersey). In addition, there are 35 companies which are jointly owned by the majors. In fact, all majors are joint owners in some of these companies, and as many as 12 of the majors are affiliated with a single company.[1] The names of the subsidiaries do not usually indicate that they are owned by the majors. This is confusing to most people, and it is not uncommon for authors and oil men to refer, for example, to Standard Oil Co. (New Jersey) as Standard Oil Co. of New Jersey, when, in fact, they are different companies. There are at least a dozen companies with the name Standard Oil Co. with the State of incorporation used to differentiate them in common usage.

TABLE 2.—*Total assets, date, and State of incorporation of the major oil companies* [1]

Name of company [2]	Total assets, Dec. 31, 1939 (thousands)	State of incorporation	Date of incorporation [3]
Standard Oil Co.[4]	$2,034,989	New Jersey	Aug. 5, 1882
Cities Service Co	1,068,578	Delaware	Sept. 2, 1910
Socony-Vacuum Oil Co., Inc.[4]	929,066	New York	Aug. 10, 1882
Standard Oil Co.[4]	723,079	Indiana	June 18, 1889
The Texas Corporation	661,067	Delaware	Aug. 26, 1926
Standard Oil Co. of California [4]	628,618	do	Jan. 27, 1926
Gulf Oil Corporation	523,292	Pennsylvania	Aug. 9, 1922
Shell Union Oil Corporation	401,048	Delaware	Feb. 8, 1922
Consolidated Oil Corporation	357,848	New York	Sept. 23, 1919
Phillips Petroleum Co	223,280	Delaware	June 13, 1917
Tide Water Associated Oil Co.[4]	204,467	do	Mar. 5, 1926
The Atlantic Refining Co.[4]	203,400	Pennsylvania	Apr. 29, 1870
Union Oil Co. of California	187,066	California	Oct. 17, 1890
The Pure Oil Co	178,567	Ohio	Apr. 9, 1914
Sun Oil Co	146,431	New Jersey	May 2, 1901
The Ohio Oil Co.[4]	133,748	Ohio	July 30, 1887
Continental Oil Co.[4]	127,661	Delaware	Oct. 8, 1920
The Standard Oil Co.[4]	76,072	Ohio	Jan. 10, 1870
Mid-Continent Petroleum Corporation	65,103	Delaware	July 9, 1917
Skelly Oil Co	62,048	do	Aug. 20, 1919
Total	8,935,428		

[1] Total assets are taken from the annual reports to stockholders for the year ended Dec. 31, 1939; the name of the company, State, and date of incorporation are as reported to the Temporary National Economic Committee in response to question 1 of the questionnaire for oil companies, 1939.

[2] Frequently the State of incorporation is added to the name of some companies to readily differentiate them.

[3] The date of incorporation is the latest one and does not necessarily indicate the origin of the company, since some companies were reorganized and reincorporated.

[4] Companies which were a part of the Standard Oil Trust. Some companies were reorganized and reincorporated after the 1911 dissolution.

[1] *United States* v. *American Petroleum Institute et al.*, Complaint, No. 8524, filed in the District Court for the District of Columbia, September 30, 1940, p. 12.

Only a small portion, less than 5 percent, of the subsidiary companies mentioned above are fully integrated. For the most part they are engaged in one or two divisions of the industry, but the operations are complementary to the other subsidiaries and the results are the same as if they were divisions or branches of large companies.

Four of the largest major oil companies are holding companies; the other 16 are both holding and operating. Nine of the 20 majors are incorporated under the laws of Delaware. As is the case of most large corporations, the officers control the voting stock so completely that they need not consider stockholder approval of their decisions and policies. In the meetings held by 17 of the major oil companies in 1938, the officers voted an average of 99.3 percent of the common stocks voted.[2]

The stock of several majors is closely held.[3] For example, the 100 largest stockholders of Shell Union Oil Corporation and Sun Oil Co. held 88.9 and 84.9 percent, respectively, of the common stock at the end of 1938.[4] Certain influential stockholders have interests in many companies. The Harkness and Flagler group, original partners of Rockefeller, and the Rockefeller group have substantial interests in the 6 majors of the Standard group. This interlocking of dominant stockholders makes it easier to pursue concerted action against independent competitors and tends to establish a strong possibility of cooperation. This is especially true of the majors that were a part of the Standard Oil Trust.

OWNERSHIP AND CONTROL BY BRANCHES OF THE INDUSTRY

The importance of the 20 major companies has grown appreciably in the past 15 or 20 years. From 1926 to 1937 their share of total crude oil production rose from 46.3 to 52.5 percent; of crude oil stocks, from 76.6 to 94.2 percent; of refining capacity, from 65.5 to 75.6 percent; and of gasoline production, from 71.3 to 83.8 percent.[5] Table 3 shows their percentage of control by the various branches or activities of the industry for the most recent year.

In 1937 the major companies owned 23.7 percent of the producing oil wells. However, their share of the flowing wells is much greater, as indicated by the fact that they produced 52.5 percent of the crude oil of the United States from these wells.[6] This apparent deficiency in crude oil production is compensated by their being able to purchase crude oil in a market controlled by them through pipe lines. This will be developed under the subject of pipe line control. In 1937 the consumption of crude oil or runs to stills by the 20 majors was 997,016,000 barrels. Their production of crude oil was 671,992,000 barrels, which means that the deficiency of 325,024,000 was obtained from the independents. Further analysis of the concentrated control and ownership will be developed in treatment of the different divisions of the industry.

[2] Hearings before the Temporary National Economic Committee, 76th Cong., 2d sess., Part 14, Petroleum Industry, p. 7105.
[3] Hearings before the Temporary National Economic Committee, Part 14-A, pp. 7775-7778; see also appendix, table 5, p. 62.
[4] Appendix, chart III, facing p. 60, and table 5, p. 62.
[5] Based on a special tabulation by U. S. Bureau of Mines in 1938 for the Temporary National Economic Committee, Hearings, Part 14, p. 7105.
[6] Appendix, table 7 and chart V, pp. 66-67.

TABLE 3.—*Percentage of ownership or control of branches of the American petroleum industry by major oil companies* [1]

Branch	Number of companies	Percentage	Year
Total investment [2]	20	60.0	1939
Producing oil wells [3]	20	23.7	1937
Crude oil production [3]	20	52.5	1937
Crude oil gathering pipe line mileage [3]	20	57.4	1936
Crude oil trunk pipe line mileage [4]	14	89.0	1938
Investment in pipe lines [4]	15	77.4	1938
Pipe line operating income [4]	15	86.4	1938
Deadweight tonnage of tankers [5]	15	87.2	1938
Stocks of refinable crude oil [3]	20	96.5	1937
Daily crude-oil capacity [6]	20	75.6	1938
Daily cracking capacity [6]	20	85.2	1938
Crude oil runs to stills [3]	20	82.6	1937
Production of gasoline [3]	20	83.8	1937
Stocks of finished gasoline [3]	20	90.0	1937
Gasoline pipe line mileage	16	96.1	1939
Domestic sales of gasoline	18	80.0	1938

[1] See Complaint No. 8524, *United States* v. *American Petroleum Institute et al.*, filed in the District Court for the District of Columbia, Sept. 30, 1940, p. 31; appendix, chart XIX, facing p. 95.
[2] Standard Statistics, Inc., the Petroleum Industry, New York, February 1940 and annual reports to stockholders for the year ended Dec. 31, 1939.
[3] Special tabulation of the U. S. Bureau of Mines in 1938 for the Temporary National Economic Committee, Hearings, Part 14–A, pp. 7714, 7716–7718, 7720, and 7735.
[4] Interstate Commerce Commission, Statistics of Oil Pipe Line Companies, 1938.
[5] U. S. Maritime Commission, Division of Research, Special Report 2838, October 1938.
[6] U. S. Bureau of Mines, Petroleum Refineries, Including Cracking Plants, Jan. 1, 1938.

THE COMPETITIVE ADVANTAGES OF INTEGRATION

The Standard Oil Trust was not integrated in a way comparable with the majors today. Its main control was in refining and transportation. Since that time, however, the tendency has been for all companies to become fully integrated so as to control oil from the wells to the consumer and to protect their large amount of capital. About 20 years ago the production end of the oil business was much more risky, and the majors preferred to buy more oil, but now with the accumulation of underground reserves it is quite advantageous. Likewise, with the growth of automotive transportation filling stations were built, and to insure adequate outlets the majors built their own stations which they continue to control. This makes it possible to advertise successfully on a national scale. Independents selling in a very limited area cannot achieve these results.

When the Standard Oil Trust was dissolved in 1911 there were other companies which were fairly well integrated as a partial defense against its control. These companies were Texas, Gulf, Pure, and Union,[7] which are prominent majors today. Since the Standard Oil units were engaged for the most part in only one division, steps were taken to acquire or merge with other companies so as to obtain the advantages of integration. Thus, Standard Oil Co. of New York took over Magnolia Petroleum Co. in 1918; Standard Oil Co. (Indiana) had its charter amended in 1917 to permit it to engage in producing and transporting crude oil and soon purchased some producing and refining companies, including the Midwest Refining Co. in 1921; Continental Oil Co. merged in 1924 with Mutual Oil Co., an integrated company; Standard Oil Co. of California merged in 1926 with Pacific Oil Co., the largest crude oil producer in the United States at that time; Standard Oil Co. (New Jersey) got control of Humble Oil & Refining Co. in 1917, a fully integrated company and a valuable

[7] Poor's Manual of Industrials, 1914, Fifth Annual Number, New York, pp. 1532, 1908, 1950, 2188, and 2303.

source of crude oil and refined petroleum products for its eastern territory.[8]

The earnings of the majors for the years 1924 to 1938 averaged 8.9 percent on the par or stated value of the common stock, or 5.6 percent on the book value of the common stock.[9] This alone does not suggest strong monopoly control, but it is significant that these companies earned their profits largely in the divisions in which the monopoly position is most clearly indicated. As a result of integration it is possible to lose money in one division and show a profit at the end of the year on the entire activities. Mr. Dorsey Hager commented on the advantages of integration as follows: [10]

> Integration is of great advantage to a concern in that profits from one branch may be used to offset losses in another. Oil may be produced at a loss, but the refinery may make money; or the marketing branch may suffer losses which are offset by the producing, the refining, or the pipe-line branches. In times of severe depression a large oil concern may earn a profit due to its integration.

The marketing division is usually operated at a loss, but it does make a dependable outlet and extension of other divisions possible. Likewise, a rigid price structure can be maintained. The earnings by divisions of the industry as reported by the majors to the Temporary National Economic Committee certainly support this view. Out of the eight companies answering this inquiry six had an average loss in marketing in 1938 of 6.7 percent and two reported profits of 5 and 4.5 percent each.[11] During the same year the average rate of return for pipe line companies of the majors was 26.5 percent.[12]

THE AMERICAN PETROLEUM INSTITUTE

The Institute with its main headquarters in New York is the primary trade association and is essentially engaged in activities to more effectively assist the major oil companies in controlling the petroleum industry. Its membership is open to any individual in the oil business, but for all practical purposes it is dominated by the majors. The work of the Institute is largely accomplished through industry committees which cover every branch or activity of the petroleum industry and the membership of the committees indicates very conclusively that the majors do predominate.[13] The Institute is one of the strongest means that the majors have in dominating the industry; the Darrow Board referred to it as operating "the switchboard for the controlling companies." [14] Voluntary contributions to the Institute in 1936 amounted to several hundred thousand dollars.[15] The annual dues of $10 are relatively small, and they amount to only a small percentage of the annual expenditures.[16]

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[8] Federal Trade Commission, Petroleum Industry, Prices, Profits and Competition, Washington, 1928, pp. 84–98, for an analysis of acquisitions and mergers of oil companies since 1911. The report states: "Standard units have made acquisitions for the purpose of greater integration of the particular units involved" (p. 98). In reference to acquisitions of Standard Oil Co. of New York, it says: "These acquisitions greatly strengthened the Standard of New York as an individual unit in the industry and changed it from practically only a marketing company to a completely integrated organization" (p. 93). See also testimony of J. Howard Pew, president of Sun Oil Co., hearings before the Temporary National Economic Committee, Part 14, p. 7168.

[9] Appendix, table 4, p. 61.

[10] Dorsey Hager, Fundamentals of the Petroleum Industry, McGraw-Hill Book Co., New York, 1939, p. 389.

[11] Hearings before the Temporary National Economic Committee, Part 17–A, pp. 10040–10042.

[12] Interstate Commerce Commission, Statistics of Oil Pipe Line Companies, Washington, 1938.

[13] See American Petroleum Institute, Petroleum Facts and Figures, 1939, for the list of members serving on the various committees.

[14] National Recovery Review Board, Second Report to the President, Ward & Paul, Washington, 1934, p. 51.

[15] State of New York, Legislative Document No. 93, 1939, p. 70.

[16] William J. Kemnitzer, Rebirth of Monopoly, Harper & Bro., New York, 1938, p. 28.

The Institute publishes and sends to its members a weekly statistical bulletin which covers crude oil production, runs to stills, stocks of crude oil, and refined petroleum products, imports, and exports. In addition to this weekly bulletin an annual digest is made.[17] These statistics are reported voluntarily to the Institute each week by the members which serves the purpose of lessening competition and making integration more effective and profitable. The following news story shows how the Institute operates to assist the majors in controlling stocks: [18]

> With gasoline storage now heading for the 86,000,000 level by March 31, Mr. Van Coven suggested that, in order to facilitate a reduction in gasoline stocks of 25,000,000 during the summer season, runs to stills should be restricted to a daily average of 3,252,000 barrels during the second quarter and to 3,232,000 barrels during the third quarter.

Mr. Van Coven is director of the department of statistics of the American Petroleum Institute, and this obviously had an effect on the price structure.

In December 1924 the public relations committee was organized and it was claimed by spokesmen for the independents that its main function was propaganda.[19] It cooperated with trade journals, prepared speeches, and gave out other information to obtain public goodwill. The Institute abolished this committee on May 31, 1940, for fear of action for violation of the antitrust laws.[20]

With this analysis of the basic factors in the majors' control and special characteristics of the industry, more detailed treatment will be given now for each of the four divisions, beginning with production.

[17] W. R. Boyd, Jr., executive vice president, American Petroleum Institute, Institute's Various Activities Render Valuable Service to Every Branch of the Petroleum Industry, Oil and Gas Journal, Tulsa, May 31, 1934.

[18] New York Journal of Commerce, February 17, 1939. On this point see also the Institute's "Quarterly."

[19] William J. Kemnitzer, op. cit., p. 26.

[20] Journal of Commerce and Commercial, May 31, 1940, p. 3.

CHAPTER III

PRODUCTION

OIL DISCOVERY AND PRODUCTION METHODS

The function of the producing division of the petroleum industry includes the exploration for and recovery of crude oil. As previously pointed out this division has by far the greatest amount of invested capital. In the prospecting and exploration activities we find independents taking a rather important part and are quite willing to gamble on their skill. Exploration for crude oil is of 2 general types—random and scientific—and both kinds are essential despite recent technologic advances. It can be said that the majors use more scientific technique and equipment, while the independent continues this work with the minimum of equipment, but taken as a whole they do rather well. This does not imply, however, that they hold the economic advantages which would appear to be the result of their successes. These independent prospectors, known as "wildcatters," are willing to take chances on a venture whose odds have been from 30 to 40 against striking oil.[1] On the other hand, under the best modern methods used by majors in special areas, the odds are as low as 8 to 1.[2] It is estimated that over half the oil has been discovered through random and casual drilling.[3] Some of the best known fields have been discovered by independents. In October 1930 Mr. Dad Joiner, an independent prospector, discovered the East Texas field after the majors had passed it up. This field has by far the greatest reserve ever discovered and is considered as having an ultimate recovery of over 4,000,000,000 barrels. But, as will be developed more fully later, the advantages of the large discoveries usually go to the majors. The field is now controlled by the majors through leases and pipe line ownership and shipping restrictions.

Another example of independent discoveries is the Kettleman Hills field in California. Milham Oil Co. discovered this important field in 1930 after spending $500,000. But Standard Oil Co. of California held half the acreage in this field in 1939 with a reserve of over a half billion barrels on its own properties.[4]

The operations of the individual or small company differ from the large companies. Prospecting is the venturesome, risky, and speculative branch of the industry, always exciting and highly profitable when successful. A survey of the discoveries of oil as reported in the oil journals indicates that in units of pools the small companies and individuals have made twice as many discoveries as the majors, yet

[1] Hearings before the Temporary National Economic Committee, statement of E. DeGolyer, Part 14, p. 7664.
[2] Idem.
[3] Idem.
[4] Dorsey Hager, Fundamentals of the Petroleum Industry, McGraw-Hill Book Co., New York, 1939 p. 373. He also refers to this case with this comment: "Although that concern did not discover the field, it has benefited by the discovery, which will probably net the concern as much as the whole value of the company before the Kettleman field was opened."

these same majors own or control about 70 percent of the proven crude oil reserves.

TECHNICAL CONSIDERATIONS IN DRILLING

The petroleum industry gets its finished products from two raw materials, commonly known as crude oil and gas. Essentially an oil pool is an underground reservoir of oil. As soon as a hole is pierced by drilling a well, the expansion of gas in solution, called gas pressure, usually forces out the oil.[5] As more and more crude oil and gas are obtained from the well, the pressure becomes weaker and finally the oil can be recovered only by artificial means.

When oil is discovered in a particular area by drilling, other landowners in the area must start drilling or their share of the oil will be lost. Under the "rule of capture" the courts have held there is no remedy for proportionate recovery of underground oil according to land area. Since this is true and because oil will shift over a considerable area, efforts have been made to solve unnecessary competitive drilling by drilling the area as a unit. In some cases this has caused hardships when minority interests have not been able to recover their share of oil as rapidly as their needs required. This is better understood when one considers that the majors have control over the acreage and reserves.

CONTROL OF CRUDE OIL RESERVES

The committee on petroleum reserves of the American Petroleum Institute estimated the proven crude oil reserves of the United States to be 17.3 billion barrels as of January 1, 1939. Sixteen major oil companies reported 8.9 billion barrels of proven crude oil reserves, or 51.4 percent of the total as of January 1, 1939. The other 6 companies have 20 percent of the acreage and if their crude oil reserves were estimated by using the same ratio of acreage and reserves for the other 16 majors, the total reserves of the major group would be at least 70 percent of the total reserves. The most important companies holding crude oil reserves are Standard Oil Co. (New Jersey), the Texas Corporation, Gulf Oil Corporation, and Socony-Vacuum Oil Co., Inc , which together have about 32 percent of the total reserves.

Mr. E. DeGolyer in his testimony before the Temporary National Economic Committee in the fall of 1939 stated:

> Whether by force of circumstance or design, the big companies are able to market their reserves less rapidly than are the small companies and individuals.[6]

He also shows that the 10 largest companies have approximately 50 percent of the crude oil reserves and gross production of only 36.8 percent, or a net of 31.5 percent of the total production.[7] This is made possible through their control of the crude oil market through pipe lines.

The statistics on crude oil reserves by fields show that the percentage of reserves held by individual majors is very high. In many cases it

[5] J. B. Umpleby, "Reservoir Energy," Transactions of A. I. M. M. E., Petroleum Development and Technology, 1933, pp. 22–32.

[6] Hearings before the Temporary National Economic Committee, Part 14, p. 7393. The following colloquy is recorded at page 7394:

"The CHAIRMAN. Well, do you mean that the big company, the major company, tends to develop and transport and distribute the refined products more slowly than the independent?

"Mr. DEGOLYER. I don't know the extent to which that tendency may run through the other branches of the industry, but it is actually a fact that he gets to market with his reserves much more slowly than the independent does. When I say he gets to market, I am referring to the crude market now."

[7] Ibid, p. 7393.

is 100 percent. A large number of the oil fields are developed and owned jointly by major oil companies. A very good example of this is the Kettleman North Dome Association in which eight majors have a joint interest.

Practically all the acreage in proven areas has been leased, and most of it is controlled by major oil companies. At the end of 1925 the successor companies of the old Standard Oil Co. of New Jersey controlled 47.4 percent of the proven acreage. Although all these holdings were not in rich producing areas, consolidations since 1925 and the acquisition of further reserves by the Standard Oil groups have substantially raised this percentage.[8]

LEASING ACTIVITIES OF MAJOR OIL COMPANIES

It has already been established that the independent oil prospector discovers about twice as much oil as the majors, but the majors have approximately 70 percent of the proven crude oil reserves. This favorable position of the majors in reference to reserves is largely due to their leasing activities which tends to establish an important control. The majors have been active in leasing prospective oil lands after oil possibilities developed. Their policy is to lease this land and then decline to drill until oil is discovered elsewhere. One object of this is to limit production of independents.

Mr. John E. Shatford, an independent oil man of El Dorado, Ark., advised the Temporary National Economic Committee on this activity as follows: [9]

> At the present time the policy which is being followed by major companies wherever circumstances permit is one which seeks to effect exclusive ownership of newly discovered producing horizons. In the current search for new deposits, particularly where deep horizons are being explored, such secrecy as may be thrown about their operations is used to avoid outside participation in the leasing of mineral rights in an area which any company or group of companies may have found. It is not at all uncommon for leasing crews to be dispatched at daybreak to cover an area within which the suspected structures may lie for the purpose of procuring oil and gas leases. Contrary to former practice these companies do not confine themselves to the purchase of leaseholds. They now purchase royalty interests which give them a share of one-eighth of the oil which customarily goes to the owner of the land. Customarily they buy these royalty interests at or near the nominal price which they pay for leases. When their leasing is complete they review the situation and make an immediate effort to eliminate from the so-called block any ownerships of oil and gas leases which may be held by others than their own type of operator.

It usually works out this way: An individual owns a small lease which shows on the major company's map as being in a probable productive area. He will then be approached by a representative of the major company who will probably offer a higher price than they have been paying for leases before that time. If the independent owner will not sell at these terms, an effort is made to trade him a certain number of acres of royalty interest for his lease. If necessary, he will be offered a royalty interest in a better position on the structure than his lease. Until a few years ago when enforced unitization [10] began to be used it was customary for the majors to pay finally whatever price the

[8] Federal Trade Commission, Petroleum Industry: Prices, Profits and Competition, Washington, Government Printing Office, 1928, p. 78.

[9] Hearings before the Temporary National Economic Committee, Part 15, pp. 8532 and 8533.

[10] State regulations requiring different holdings in a field to be drilled as a unit in order to prevent competitive drilling.

relatively small lease appeared to be worth, based upon the value of acreage which by that time might have been developed.

Their primary aim is to lease land as rapidly as possible after it is discovered and to make every effort to control its production so that the best possible price can be obtained. As long as a small company has a lease on the structure it is difficult to hold these reserves.

Mr. E. De Golyer in his testimony before the Temporary National Economic Committee supports this conclusion. As an authority on production and selected by the American Petroleum Institute to testify as their witness, he pointed out that Standard Oil Co. (New Jersey) had about 2½ billion barrels of reserves and "are being produced at approximately 40 percent of the rate averaged for the rest of the Nation's production."[11] He claims that this is typical of the other majors and they maintain these reserves to protect their other investments in the integrated form. Very few independent producers are engaged in other divisions of the industry.

FORM 88 LEASE AND ITS ABUSE

The "88 Form lease" is a standard lease that came into existence about 1916, is well known to landowners, and carries with it implied covenants which have been written into it by the courts.[12] This lease protects the landowner and gives him assurance that his land will be developed in a reasonable time and not just tied up to the advantage of his competitor. There have come into existence in the last 4 or 5 years leases which purport to be Form 88 leases. They use the word "revised" or "special" which materially placed greater burdens upon the landowner with respect to his remedy for failing to develop the property.

The reason for maintaining the style 88 Form lease is that a feeling has grown up among landowners that an 88 Form lease is best and will protect their interests. It is doubtful if the average landowner would sign a lease that did not appear to be an 88 Form. However, these new leases in fact not only revise but also, as far as the landowner is concerned, change the so-called standard 88 Form lease. The main changes in all of them are (1) the change of the term from 5 to 10 years and (2) the change for the breach of the implied covenant. It is significant that the "OR" lease used from 1901 to 1916 provided that unless the lessee drills he must pay rental.

The major oil companies have been instrumental in changing this lease, so that they could lease acreage and wait many years before developing it. It is obvious that this worked to the disadvantage of the landowner, who was unable to hire sufficient counsel and had established faith that his interets would be protected. It appears that the lessor is induced by agents of the majors to execute a lease upon a form which by its identification he is deceived into believing is the standard form.

INDEPENDENT'S PROBLEM OF GETTING DRILLING PERMITS

Most of the important oil fields are controlled by the majors—that is, they have a majority interest. When an independent has a

[11] Hearings before the Temporary National Economic Committee, Part 14, p. 7393.
[12] Testimony of Robert C. Knox, Hearings before the Temporary National Economic Committee, Part 15, pp. 8251-8261.

minority interest in a field and wants to drill his own well rather than pool his interests, or sell them, he usually has trouble in getting a permit to drill. An excellent example of this was the Old Ocean field in Texas which is controlled by major interests, except a 20-acre tract held by John W. Dailey. He has been trying to get a permit to drill, but has been refused several times through the influence of majors. It was only in October 1939 that the Supreme Court of Texas overruled the Texas Railroad Commission and granted him a permit to drill his own well. In spite of this he still faces the problem of getting a drilling contractor for fear of their suffering from the ill-will of the majors. The details of this typical case were brought out before the Temporary National Economic Committee by Mr. Dailey.[13] It conclusively shows how a landowner in Texas was unable to drill a well on his own land rather than delay drilling or drill jointly with major owners who had sufficient wells elsewhere. This makes a big difference to anyone who has oil in only one possible place and cannot depend on sources elsewhere. In addition to obtaining control of crude oil reserves, State and Federal programs in the name of conservation have been sponsored by the majors to restrict production.

CONSERVATION AND STABILIZATION

Conservation usually means that limited resources are saved so that they may be used by the present and future generations. True conservation of oil may be defined as the avoidance of waste in its recovery or use.[14] This means that we should eliminate losses in recovery or use if they may be avoided without undergoing costs in excess of the costs involved in suffering the losses. Suppose a new pool has a deposit of 100,000,000 barrels of petroleum of which 20,000,000 barrels may be recovered by a particular method whereas 40,000,000 barrels may be recovered by a different method at the same, or a lower average cost per barrel, then it is evident that the first method represents waste, which should be avoided. True conservation should not go beyond this type of waste and should not be concerned with production control based on estimates of market demand. It should be directed toward better economy through greater efficiency.

Stabilization, on the other hand, is applicable to regulative efforts to obtain improvement in economy, regardless of the effects upon efficiency. If market demand for oil is so small that effective proration causes wells to be operated at less than their most efficient rate proration may damage the reserves by water flooding and trapping of the oil. Production control or stabilization based on market demand is essentially a form of monopolistic control supported by the States.[15] The effect of stabilization may reach back to the oil exploration and conceivably limit that important function. The restriction of production usually assures the maintenance of desirable prices and will tend to raise prices. Although the demand for gasoline is considered fairly inelastic, other petroleum products, such as fuel oil, may be considered elastic.

[13] Hearings before the Temporary National Economic Committee, Part 14, pp. 7291 and 7520.

[14] For a thorough discussion of the economics of conservation and stabilization see Myron Watkins, Oil: Stabilization or Conservation, Harper & Bros., New York, 1937; also National Resources Committee, Energy Resources and National Policy, Government Printing Office, Washington, January 1939.

[15] See George W. Stocking, "Stabilization of the Oil Industry; its Economic and Legal Aspects," American Economic Review, Supplement, March 1933.

ECONOMIC CONSEQUENCES OF PRORATION

The term "proration" is generally used and applied as the equivalent of curtailment or conservation. This is a misleading usage. In the strict sense of the word proration means the distribution between the units of a lease, field, or State of a total permitted production. That is, proration is concerned solely with allocation of a total amount of allowable production. The determination of how large this total allowable production shall be is not proration. It must be recognized that many measures urged under the guise of conservation are not motivated by considerations of conservation at all but are rather means for bringing about slow development of a field and consequently price stabilization.

Proration works a hardship on the nonintegrated operator and works to the advantage of the majors who have many sources of crude oil. When the output of wells is restricted, the cost per barrel is increased and a longer time is required for the nonintegrated operator to amortize his investment. Usually the small operator has a very limited amount of capital and is often forced into bankruptcy, since he can operate his wells only in a limited way. The major interests then have an opportunity to buy these properties at special prices. As these independent producers are unable to supply their own refineries or independent refiners this activity is put at a distinct disadvantage. Under this system the operator having a limited number of wells is progressively subjected to lower "allowables." Since the major oil companies have vast oil lands in States which do not have proration laws, that is, California and Illinois, together with imports and storage facilities, they can be assured of an adequate supply of crude oil. Furthermore, the majors who sponsor proration use cracking facilities and get about twice as much recovery of gasoline, while the independents use for the most part the straight-run process. The "allowable" based on the market demand does not take this into consideration. As a result of proration the price of crude oil is rigid for long periods [16] and when it does change it is rather abrupt as was the case in the fall of 1939 just prior to the forced shut-down in Texas.

APPARENT MOTIVES UNDERLYING PRORATION

It is important to point out again that conservation is directed toward better economy through the introduction of superior efficiency, whereas stabilization is an attempt to increase the profits of the industry, regardless of any changes in efficiency.[17] Most that has been done in the oil industry in the name of conservation is really stabilization. In times of a shortage of crude oil the rise of a conservation movement is probably intended to increase the relative recovery and the more efficient uses of our oil resources. On the other hand, pressures for conservation which are made by the major interests during a period of excess production and low prices, are intended mainly for the purpose of getting a system of production restriction. Thus, the interest in conservation in 1931 and 1932 after the discovery of the East Texas field was really a part of the campaign for stabilization measures. The majors were threatened by the influence of the independents, since they did not have adequate storage facilities to

[16] Appendix, chart VI, facing p. 71.
[17] Myron W. Watkins, Oil: Stabilization or Conservation, Harper & Bros., New York, 1937, p. 35.

buy this oil and keep it off the market. There was some physical waste and many public officials supported the measure so as to reduce these wastes, but for the most part the proposals for proration were made primarily to solve the problem of instability in the industry.[18] Mr. Amos L. Beaty, former president of the American Petroleum Institute, testified before the Federal Oil Investigating Committee in 1934 that stabilization was the primary aim of the oil companies in proposing Federal quota restrictions on the production of oil.

Watkins and Kemnitzer emphasize in their oil studies that proration is not primarily a system of conservation of resources and may lead to waste.[19] Proration will bring about poor methods of production if it results in a uniform allowable per well, regardless of the nature of the underground reservoir. Under such circumstances the rate of production for some wells is too low and for others too high. Monthly proration schedules indicate that present State proration schemes are still based primarily upon a more or less constant allowable per well. In East Texas, for example, where the independents have very productive wells, it is easy to see how this restriction will be to the advantage of the majors, since it would tend to keep oil off the market.

EARLY EFFORTS AT CONTROLLED PRODUCTION

Due to the rapid rise in stocks of oil in storage and the weakening of the price structure, the Federal Oil Conservation Board was established December 19, 1924, by President Coolidge. Petroleum prices rose sharply in 1925 and 1926. In 1926 most of the industry did not believe a shortage of oil existed. However, Mr. Henry L. Doherty, head of Cities Service Co., led a fight for production control, claiming a shortage of oil was threatened and methods of production were inefficient. Mr. Charles Evans Hughes, representing the American Petroleum Institute, stated that the Federal Government had no power to control production and that the industry could be best assisted by Government permission for intercompany cooperation.[20]

By the end of 1926 discoveries had become so numerous and production of crude oil so great that stocks of oil in storage were rising and prices were falling. In that year the Federal Oil Conservation Board proposed that some kind of interstate agreement or compact be made for the purpose of restricting crude oil production. Overproduction of oil occurred during the next few years, and the wholesale price index fell from 100 in 1926 to 71.3 in 1929. In that year the Board again proposed an interstate compact to aid in restricting production. The Board also considered in 1929 a plan of the American Petroleum Institute for world-wide limitation of production to demand. The Attorney General held that the Federal Oil Conservation Board had no right to approve any such production-restriction program.[21]

At this time the Federal Government decided it was powerless to restrict production except by obtaining agreements among the producing States. A meeting of the Governors of these States was held in Colorado Springs, Colo., in 1929 for the purpose of seeing how pro-

[18] National Resources Committee, Energy Resources and National Policy, Washington: Government Printing Office, January 1939, p. 200.
[19] Myron W. Watkins, op. cit., p. 34; William J. Kemnitzer, op. cit., p. 118.
[20] Federal Oil Conservation Board, Public Hearings, May 27, 1926, pp. 13-23.
[21] Northcutt Ely, Oil Conservation Through Interstate Agreement, 1933, p. 17.

duction control could be accomplished through joint action. This particular conference failed and the Board discontinued its efforts.

Production continued to exceed demand and stocks were rising. In 1931 the Secretary of the Interior declared there was no remedy except the adoption of an interstate oil compact approved by Congress.[22] The Governors set up an Oil States Advisory Committee which entered into an informal production accord in September 1931 which lasted until the end of 1932.

CONTROLS DURING THE NATIONAL RECOVERY ADMINISTRATION

The administration of the Oil Code was under the Secretary of the Interior. Section 9c of the act provided for the prohibition of the transportation in interstate and foreign commerce of oil produced in excess of the amount permitted by the proration laws. The code provided for limitation of imports of crude oil, for restrictions on the withdrawal of crude oil from storage, for periodic estimates of the consumer demand, the allocation of production among pools in the State. Furthermore, it contained provisions whereby the price of crude oil was based on the wholesale refinery price of gasoline.[23]

THE CONNALLY ACT

Before the invalidation of the N. R. A., Congress passed on February 22, 1935 the Connally Act as a substitute for section 9c. It specifically prohibited the movement in interstate commerce of "hot oil"; that is, oil produced in excess of quotas. The main aim was to apply the act to the East Texas field. The law has been renewed from time to time and is in effect now. Generally speaking the majors have favored this law, but many of the independents have been critical as was voiced by some witnesses at the hearing of the Temporary National Economic Committee in the fall of 1939.

MARKET CONTROL THROUGH FORECASTS AND STOCK REPORTS

The United States Bureau of Mines makes monthly forecasts of motor-fuel demand and stocks of gasoline. The estimating of market demand was taken over by the Bureau of Mines in 1933 and became the basis of national planning in the petroleum industry. These statistics are used by the proration authorities to limit production to market demand and therefore assure price stabilization. It is doubtful if a private agency could furnish similar statistics for the oil companies for the purpose of price control and be within the law. The American Petroleum Institute also publishes weekly stock reports and "Quarterly" suggestions on supply and demand, although they are not used officially as are the statistics of the United States Bureau of Mines. However, they serve their purpose in lessening competition.

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[22] National Industrial Conference Board, Oil Conservation and Fuel Oil Supply, New York, 1930.

[23] National Recovery Administration, Code of Fair Competition for the Petroleum Industry, Washington, 1933.

PROGRESSIVE INCREASES IN PROVEN CRUDE OIL RESERVES

It has already been shown that the major oil companies in sponsoring production control measures, such as proration, have used the argument that it is a conservation measure. Table 4 indicates very clearly that the proven reserves of crude oil have continued to increase, which certainly does not lend any weight to the argument that our oil supply will soon be gone and we should therefore have production control. Mr. Gill in his very thorough study [24] of this subject in 1934 shows that there is (1) no imminent danger of exhaustion of the petroleum reserves of the United States; (2) that when or if the reserves should ultimately become exhausted, there exist practically inexhaustible supplies of other materials from which gasoline could be produced at prices only slightly higher than the prices now prevailing for petroleum products. Mr. W. S. Farish, president, Standard Oil Co. (New Jersey), also supports this latter conclusion.[25] Since crude oil reserves have been increasing progressively and are higher than ever before, and other sources of gasoline, such as shale and coal, are almost unlimited in quantity, there is no real basis for the major oil companies to press for proration under the name of conservation to obtain economic advantages of a stabilized price structure to the disadvantage of independents.

TABLE 4.—*Comparison of crude oil production since 1859 with cumulated discoveries of crude oil, indicating proven crude oil reserves, United States, 1900–38*

[Millions of barrels]

Year	Cumulated discoveries	Production since 1859	Indicated reserves	Year	Cumulated discoveries	Production since 1859	Indicated reserves
	(1)	(2)	(1)−(2)		(1)	(2)	(1)−(2)
1938	38, 188	21, 118	17, 070	1920	11, 860	5, 430	6, 430
1937	34, 199	19, 970	14, 229	1915	8, 935	3, 617	5, 318
1936	31, 755	18, 692	13, 063	1910	6, 435	2, 378	4, 057
1935	30, 030	17, 593	12, 437	1905	5, 060	1, 514	3, 546
1930	25, 910	13, 149	12, 761	1900	3, 360	1, 004	2, 356
1925	15, 960	8, 670	7, 290				

Source: Standard Statistics, Inc., the Petroleum Industry, New York, February 1940. Basic data on production and discoveries of crude oil compiled by the United States Bureau of Mines.

SUMMARY AND CONCLUSIONS

The majors are establishing an increasingly dominant control over crude oil reserves through leasing activities and pipe line ownership. At the end of 1939 they had control of 70 percent of the proven reserves. Since proration programs are not usually in effect in all States where a particular major operates, and his holdings of oil lands are usually quite widespread, he has a distinct competitive advantage over an independent who is permitted to produce only a small portion of his requirements in his limited area. This means that the independent

[24] Stanley Gill, A Report on the Petroleum Industry, Gulf Publishing Co., Houston, 1934, p. 18.
[25] U. S. Cong., Petroleum Investigation, Hearings on H. R. 441, 1934, p. 752.

refiner who owns oil lands is forced to operate his small plant only about half time. Obviously, the fixed charges must be met and this increases his unit costs; on the other hand the majors operate at a high percentage of capacity. The majors through their leasing activities of oil land, and by following a policy of restricted development, have obtained a very substantial control over these oil lands—only 10 percent of which are owned in fee by them. Since the majors have a virtual monopoly of crude oil pipe lines, the only practical overland means of transporting oil, they are able to post uniform, noncompetitive prices for crude oil purchased in a particular field, and the crude oil is definitely sold on a buyer's market.

Since there is no apparent danger of exhausting our crude oil reserves, the real purpose the majors have in securing proration laws is to obtain a stabilized price structure to the disadvantage of independents.

CHAPTER IV

CRUDE OIL TRANSPORTATION

THE COMPETITIVE ADVANTAGES OF PIPE LINES

The liquid form of crude oil makes it adaptable to special transportation through pipe lines and by tankers. Only 3 percent[1] of crude oil moves to refineries by railroads, owing to the greater efficiency and lower costs offered by pipe lines and tankers. The crude oil pipe line system consists of trunk lines and gathering lines which connect with the lease tanks located near the oil wells and transport the oil to the trunk line. Thus, the crude oil pipe lines provide a link between the oil fields and refineries, and the flow of crude oil is practically continuous from the lease to the refinery. It is safe to say that nearly all oil moves through gathering lines and at least 90 percent moves through trunk lines before reaching the refinery. It has made possible the location of refining centers near the market and the development of vast refineries by the majors. The pipe line affords the most efficient form of land transportation. Comparative costs per ton-mile are approximately 8.3 mills by rail, 3.2 mills by pipe line, and 1.25 mills by tankers.[2] It is probable that the rail cost would be somewhat lower if a greater volume could be transported. While the capital costs are substantial and the life of the line limited, the rights of way are not expensive, the operation of the system is automatic to a high degree, and there is no problem of two-way traffic or return movement of empty facilities. There does not appear to be any natural competition between crude oil pipe lines and railroads, since the tariff rate of crude oil pipe lines is usually about half the rail rate.[3]

The development of crude oil pipe lines had an important effect in determining the geographic location of refining. Today mass production refineries of the majors are located on the Texas Gulf coast, New York, Philadelphia, and Chicago industrial areas[4] as a result of pipe line ownership, supplemented by tanker movements from Texas and Louisiana. New discoveries of crude oil are made more readily available, thus supporting the rapid refinery expansion. There are shifts in the supply of crude oil due to new discoveries and less activity in older fields which would make it necessary to have a more widespread location of refineries if it were not for the pipe lines. But, through pipe lines the majors are able to have an adequate source of crude oil at all times. The advantage of pipe lines over rail transportation is so great that no oil company has been able to attain very much importance in the industry without the use of pipe line facilities.

[1] Interstate Commerce Commission, Statistics of Oil Pipe Lines, 1921-37, Statement No. 396, p. 11.

[2] Joseph E. Pogue, "Economics of the Petroleum Industry," March 1939, p. 35, citing as authority Lisle, Tanker Technique 1700–1936, World Tankship Publications, London, 1936, p. 9; and hearings before the Temporary National Economic Committee, Part 14, pp. 7178 and 7476; and Part 15, pp. 8591–8592.

[3] R. V. A. Mills, The Pipe Line's Place in Oil Industry, New York, 1935. The conclusion is based on the tariffs filed with the Interstate Commerce Commission for pipe line and rail rates to identical destinations.

[4] U. S. Bureau of Mines, Petroleum Refineries, Including Cracking Plants, in the United States, Washington, January 1, 1939.

On the question of competitive advantages of pipe lines the Federal Trade Commission had the following to report:[5]

The cheapness of pipe line transportation has enabled the large companies owning comprehensive pipe line systems to choose strategic locations for their refineries near seaports and the larger distributing centers of the country, while small concerns dependent on rail shipments have been forced to build their plants near the oil fields.

Owing to their adaptability and advantages, pipe lines are the strongest means the majors have in competing against independents. The system as it exists today is a virtual monopoly of the majors.[6] The National Bureau of Economic Research had this comment to make on pipe lines:[7]

Such a system of transportation involves a relatively large capital outlay which, once made, is sharply subject to the principle of decreasing cost in its operation. Operating with capital equipment that is specialized, highly automatic, and fixed, pipe line transportation partakes of the character of a natural monopoly.

The typical independent does not have sufficient capital to build these lines and his volume of business does not justify it. Therefore, unless he can use the lines of the majors he is at a disadvantage of 1 to 2 cents per gallon depending on the location of his market.

In 1906 the Interstate Commerce Commission made a thorough investigation of the oil monopoly pursuant to a joint resolution of Congress and found that the Standard Oil Trust established its greatest control of the petroleum industry through pipe lines.[8] The control that the majors have today over pipe lines is in many respects similar to that found by the Commission to exist in 1906. Some of the observations and conclusions that the Commission made in the report are:

In any industry whoever controls the avenues of transportation of either the raw material or the finished product can speedily drive all competitors out of existence. The production and distribution of petroleum is no exception to this rule (p. 6).

It is said that the pipe-line system of the Standard is a natural advantage to which that company, having created it, is entitled. It is not a natural advantage, but rather an artificial advantage (p. 6).

While pipe-line tariffs have been filed with the Commission, they are alleged to be of no actual advantage to the independent operator (p.14).

More than anything else the pipe line has contributed to the monopoly of the Standard Oil Co., and the supremacy of that company must continue until its rivals enjoy the same facilities of transportation by this means (p. 14).

It will probably be found necessary to disassociate in the case of oil, as in that of other commodities, the function of transportation from that of production and distribution (p. 14).

THE MAJOR OIL COMPANIES' CONTROL OF CRUDE OIL PIPE LINES

Crude oil pipe line operations are carried on in 24 States[9] through approximately 115,000 miles of trunk and gathering lines.[10] As of June 30, 1936, there was a total of 110,580 miles of crude oil lines,

[5] Federal Trade Commission, Report on Pipe Line Transportation of Petroleum, Washington, 1916, p. xxxi.

[6] The investigation made in 1904 by the Bureau of Corporations found the main control of the petroleum industry to be through pipe lines. See Report of the Commissioner of Corporations on the Petroleum Industry, pt. 1, "Position of the Standard Oil Co. in the Industry" Washington, May 20, 1907, pp. 1 to 38.

[7] National Bureau of Economic Research, Price Research in the Steel and Petroleum Industries, New York, 1939, p. 87.

[8] Interstate Commerce Commission, Railroad Discriminations and Monopolies in Coal and Oil. A letter from the Chairman of the Interstate Commerce Commission submitting a report of an investigation of the subject of railroad discriminations and monopolies in oil. Washington, January 28, 1907.

[9] Interstate Commerce Commission, Statistics of Oil Pipe Line Companies, Statement No. 3955, Washington, December 31, 1938.

[10] Oil and Gas Journal, Tulsa, Pipe Line Edition, September 22, 1938.

57,820 miles of which were trunk lines and 52,760 miles of gathering lines.[11] This was the last complete survey of crude oil pipe lines, but the mileage at the end of 1938 can be estimated on the basis of the percentage change for similar periods of the Interstate Commerce Commission coverage which is about 85 percent of the industry. On this basis the total crude oil pipe line mileage is 61,308 miles of trunk and 53,558 miles of gathering lines, making a total of 114,866 miles. The major oil companies had 49,371 miles of trunk lines or 85.4 percent, and 30,284 miles of gathering lines or 57.4 percent.[12] According to the coverage of the Interstate Commerce Commission, 14 majors had 89 percent of the crude oil trunk mileage on January 1, 1938.[13] This coverage of the Interstate Commerce Commission applies only to interstate lines, but this is estimated by the Commission to be over 85 percent of the industry, when compared to the complete survey made by the United States Bureau of Mines in 1936.

It is to be noted that the majors own substantially less of the gathering lines than trunk lines. As previously mentioned, the trunk lines extend long distances through important oil fields and are fed by gathering lines, which are usually only about 2 to 4 inches in diameter compared to about 8 inches for trunk lines. Trunk mileage increased 32 percent from 1929 to 1938, while gathering lines decreased 8 percent.[14] Most of the independent refiners are located in the field and when they use their own oil, their system is functionally considered a gathering system, which explains to some extent why their ownership of gathering lines is greater. Also, as already indicated, the majors buy much of their crude oil and often the producer who sells to the major owns his own gathering lines which connect to the trunk lines. The main control is through the long distance interstate trunk lines, 89 percent of which are owned by the majors.

THE EFFECT OF PIPE LINE PROFITS ON COMPETITION

The earnings of the pipe line divisions or subsidiaries of the major oil companies are by far the most profitable. All the major oil companies, except Standard Oil Co. of California and Union Oil Co. of California, make annual reports to the Interstate Commerce Commission, either through subsidiaries or jointly owned pipe lines. For the year 1938, the income of the majors was 97.7 percent of the total income reported; the investment in carrier property was 93.8 percent of the total; and the rate of return of the major group was 26.7 percent.[15] Compared to this return the independents made 9.4 percent. There was comparatively little change in these earnings during the depression and the last 15 years.[16] The Interstate Commerce Commission had this comment to make on earnings:[17]

During the period covered by the questionnaire of 1933, the larger pipe line companies, especially those affiliated with large oil companies, have made earnings through the operation of their common carrier pipe lines which are startling in view of the fact that they were made during a time of widespread depression.

[11] U. S. Bureau of Mines, Survey of Crude Oil in Storage, Washington, 1936-37, p. 44; see also appendix, charts XIII, p. 80, and XIV, facing p. 80.
[12] Appendix, chart XIII, p. 80.
[13] Appendix, chart XV, p. 83.
[14] Interstate Commerce Commission, Statistics of Oil Pipe Line Companies, Statement No. 3955, Washington, 1938, p. 4.
[15] Compiled from annual reports to the Interstate Commerce Commission for 1938.
[16] Hearings before the Temporary National Economic Committee, Part 14-A, p. 7727.
[17] Interstate Commerce Commission, "Reduced Pipe Line Rates and Gathering Charges," Docket 26570, p. 19 (mimeographed).

The major oil companies are primarily interested in the over-all profit on all operations. It is clear that the major group have substantial profits to take business away from independent refiners and marketers. The independent must show a profit on his business of refining or marketing or go out of business. Such is not the case with the majors. In order to keep down independent refiners and marketers they often take losses on these operations. Twelve major oil companies reported a break-down of earnings for 1938 to the Temporary National Economic Committee. This tabulation revealed that 9 of the 12 had a deficit on refining; 7 of the 12 had a deficit on marketing; only 1 company had a deficit on crude oil production; and no losses were reported on transportation, which also included gasoline pipe lines and oil tankers.[18]

The exorbitant rates charged by the majors, in addition to the high minimum tenders, resulted in a complaint being made to the Interstate Commerce Commission in 1934. An investigation of the conditions was ordered by the Commission under the direction of J. Paul Kelly, examiner. Mr. Kelly recommended in his proposed report that the pipe line companies be required "to show cause why the rates charged by them for the transportation of crude petroleum oil by pipe line should not be found to be unreasonable for the future to the extent that they may exceed 65 percent of the rates in effect on December 31, 1933".[19] The pipe line companies filed exceptions to the examiner's report. A joint brief filed by two oil companies in answer to the exceptions stated: [20]

> The margin between the costs of pipe line transportation and the published rates must be narrowed, or else those refiners who do not own pipe lines will be forced out of existence.

The brief further pointed out that the annual reports to the Commission show dividends paid by 17 major pipe line companies from 1929 to 1933, inclusive, equaled 98 percent of the aggregate total investments of all these companies on December 31, 1933. The examiner also recommended minimum tenders of not more than 10,000 barrels. In December 1940 the Interstate Commerce Commission entered an order requiring [21] crude oil pipe line carriers to show cause why the Commission should not order rate reductions amounting to as high as 55.01 percent of rates in effect on December 31, 1935. The Commission's decision finds that 8 percent annual return on valuation is fair and ample, after considering the hazards of unpredictable future volume of traffic.[21]

Even when independent refiners do ship over the pipe lines of major oil companies they are still at a competitive disadvantage since rates are much higher. Thus the majors can use this difference to put the independent at a competitive disadvantage. It is generally agreed that the costs of transportation are far out of line with rates charged. One example may be given to illustrate this point. Standard Oil Co. (Indiana) owns the Stanolind Pipe Line Co., which extends from fields in Oklahoma and Texas to the parent company's huge mass-production refinery at Whiting, Ind. (near Chicago), a distance of over 500 miles.

[18] Hearings before the Temporary National Economic Committee, Part 17-A, pp. 10040-10042; National Petroleum News, Cleveland, November 1, 1939, p. 10.
[19] National Petroleum News July 15, 1936, p. 20; see also I. C. C. Docket 26570—proposed report dated February 1, 1940, p. 25.
[20] Brief filed by The Standard Oil Co. (Ohio) and National Refining Company, I. C. C. Docket 26570.
[21] Interstate Commerce Commission, "Reduced Pipe Line Rates and Gathering Charges," Order of December 23, 1940, Docket 26570.

During 1938 the Stanolind Pipe Line Co. transported 34,485,625,000 barrel-miles of crude oil at a cost of $11,050,478, which included all operating expenses, State and Federal taxes, and fixed and contingent expenses. This is an average cost of only 0.032 cent per barrel-mile.[22] An examination of the company's tariffs filed with the Interstate Commerce Commission discloses that the rate from Oklahoma to Whiting, Ind., was 34.5 cents per barrel,[23] or 0.069 cent per barrel-mile based on 500 miles. This shows unquestionably that the cost is less than half the tariff rate which must be paid by independents if they do ship over the pipe line.

Mr. W. M. V. Splawn, a member of the Interstate Commerce Commission, in his well-known study of pipe lines had this to say on the effect of the noncompetitive rates of major pipe line companies: [24]

Speaking generally, the earnings of pipe line companies are high at the rates charged. It is urged that this fact provides an opportunity for the integrated groups which own the pipe lines to recoup from such earnings the losses they may sustain in other branches of the industry.

Mr. Louis J. Walsh, an independent refiner of Texas, testified before the Temporary National Economic Committee that it costs 17½ cents per barrel to get oil from the East Texas field to the Gulf coast by major pipe lines, but the cost to the majors is only 5 cents per barrel.

NONCOMMON CARRIER STATUS OF PIPE LINES

The large integrated oil companies opposed making pipe lines common carriers. The passage of the Hepburn Act in 1906 making pipe lines common carriers and the upholding of this act by the Supreme Court in 1914 was an attempt to check the Standard's control over pipe lines. However, these were of little help to the independents. The majors' regulations requiring minimum shipments of 25,000 to 100,000 barrels had an important effect in keeping the independents from using the lines. It does not matter how high the pipe line tariffs are so long as they transport for themselves. So far the record indicates they are common carriers in name only and not in fact. Another consideration is that it is very costly for the independents to bring cases before the Interstate Commerce Commission.

The Federal Trade Commission had the following point to make concerning restrictions in the pipe line tariffs: [25]

The tariffs filed with the Interstate Commerce Commission under this act by the Standard lines required a minimum quantity for shipment so large as to preclude the use of these lines by independent refiners in most cases. As a consequence they continued to serve only Standard refineries.

The Independent Petroleum Association of America made a study for 1936 of oil transported by major pipe line companies for companies having no interest in the pipe line.[26]

Ten companies averaged transporting only 8.73 percent of the total oil transported for companies having no interest in the pipe line.

[22] Annual report of Stanolind Pipe Line Co. to the Interstate Commerce Commission for the year ended December 31, 1938.
[23] Public Tariff Section, Interstate Commerce Commission.
[24] U. S. Cong., Report on Pipe Lines, H. Rept. No. 2192, 1933, pt. I, p. lxxvii.
[25] The Federal Trade Commission, Petroleum Industry, Prices, Profits, and Competition, 1928, Washington, p. 73.
[26] Independent Petroleum Association of America, Pipe Lines—Imports—Prices, November 1938, p. 10.

Three of the companies reported that they only transported their own oil and operated as a plant facility.

The Shell Union Oil Corporation, which operates an interstate gasoline pipe line from Roxana, Ill., to Lima, Ohio, has refused to file tariffs with the Interstate Commerce Commission. This appears to be a clear violation of the Hepburn Act of 1906 declaring interstate oil pipe lines common carriers. The Shell Co. claimed it built the line as a plant facility and should not transport for others.

NON-COMPETITIVE RESTRICTIONS ON INDEPENDENT SHIPPERS

Prior to the Supreme Court decision holding interstate pipe lines to be common carriers, the large Standard pipe line companies had always refused to act as common carriers for independent oil companies, although they acted as carriers for the various Standard refining companies. For a number of years subsequent to the Supreme Court decision, through monopolistic shipping requirements these pipe lines entirely nullified the common carrier law [27] so far as eastward shipments from the Mid-Continent oil field to independent refiners were concerned. For example, beginning in 1914 the Standard lines running east required a minimum tender of 100,000 barrels for a single shipment. It is not difficult to see what this means to the independent shipper. It means that he must build storage tanks to accumulate all this. The typical independent refiner at that time could only use 5,000 barrels per day. From an examination of the tariffs on file with the Commission today, the typical minimum tender on crude oil is 50,000 barrels. In many cases it is 100,000 barrels.

The necessity of a refinery having adequate pipe line connections of its own is well illustrated by the considerations which led the Standard Oil Co. (Indiana) to acquire a 50 percent interest in the Sinclair Pipe Line Co. Officials of the Standard Oil Co. (Indiana) contemplated building in 1920 a pipe line from the Tulsa, Okla., area to Chicago, Ill., to insure an adequate supply of crude oil. Prior to that time the company was using Sinclair's pipe lines, but due to the increased costs it could no longer do it. Finally an offer was made by Sinclair whereby Standard Oil Co. (Indiana) bought the 50 percent interest in the line.[28] In this connection it is well to point out that all the major oil companies have crude oil pipe line facilities which the independent cannot afford because of his lack of sufficient capital.

THE PIPE LINE COMPANIES' CONTROL OVER CRUDE OIL PURCHASING

As already pointed out the major group purchases a substantial amount of crude oil, about 35 percent of their refinery requirements. In the buying of crude oil from a given field there are seldom enough buyers to suggest a competitive market and in most cases the major with the trunk line sets the price. It is true that producers may use tank cars to transport their oil to the refineries or market, but this is a very expensive type of transportation. As a measure of this control, 85.2 percent of the total crude oil produced east of California in 1937 found its outlet through pipe lines controlled by 15 major oil companies. Standard Oil Co (New Jersey) alone controlled 20.4 percent of the total.

[27] The Federal Trade Commission, The Petroleum Industry: Prices, Profits, and Competition, Washington, 1928, p. 40.
[28] Ibid., p. 41.

This ownership of trunk pipe lines makes it possible to fix the price of crude oil. Furthermore, in fields where there is more than one major the crude oil prices are the same. In the vast East Texas field where there are many independent producers and six major pipe line companies buying crude oil, the posted prices of each of the six companies are the same and have changed at the same time.[29] This suggests an agreement to work together to control crude oil prices.

In the early days of the industry crude oil was bought and sold on oil exchanges. This method started in Pennsylvania and continued to about 1895.[30] During this period the market was speculative and the proportion of crude oil sold upon the exchange decreased until in 1895 the Seep Purchasing Agency of Oil City on behalf of Standard Oil Co. posted a notice that thereafter the prices paid by it to oil producers would be what the market would justify and not necessarily the price bid on the exchange. This agency purchased for Standard Oil Co. 80 percent of the crude oil produced in Pennsylvania, and through its position of transportation fixed the price of crude oil.[31] This led to the posted price system we have today. It is now a buyer's market due to pipe lines. In this connection it is interesting to compare the way such things as wheat and cotton are sold with that of oil and copper, where large corporations post their own price.

Standard Statistics, Inc., had the following comments to make concerning pipe line profits and control of the crude oil market.[32]

> There is no free market in crude oil, chiefly because virtually all purchases are made through the concentrated pipe line systems.
>
> The price of crude oil is thus artificial, and partly because of this, accounting methods and increasing proration, the industry has become geared to the price of crude oil. It is an important determinant of profits and a major factor affecting expansion and development. The division has thus been one of the chief sources of strength for major oil companies, which have emphasized the development of crude oil interests.

DIVIDENDS PAID TO THE MAJOR OIL COMPANIES BY THE PIPE LINE AFFILIATES

After the Supreme Court decision in 1914 holding interstate pipe lines to be common carriers subject to regulation by the Interstate Commerce Commission separate corporations were organized by the majors to take over the pipe line business formerly operated as departments of an integrated business. This action was taken largely because of the desire to avoid furnishing reports to the commission on their entire business. Today all except four of the pipe lines of majors are operated as subsidiary companies which pay dividends to the parent company. The effect of these huge dividends on independents has already been discussed.

Some measure of the dividends paid may be seen by comparing the dividends declared with capital stock. From 1929 through 1937 the average ratio of dividends declared to capital stock was 33.2 percent.[33] At this rate the pipe lines soon pay for themselves. Only one pipe line ever became bankrupt.

[29] Natural Petroleum News, Cleveland, Oil Price Handbook; see also appendix, chart VI, facing p. 71.
[30] Federal Trade Commission, Petroleum Industry: Prices, Profits, and Competition, Washington, 1928, p. 101.
[31] C. H. Montague, The Rise and Progress of the Standard Oil Co., Harper & Bros., New York, 1903, p. 131.
[32] Standard Statistics, Inc., The Petroleum Industry, New York, February 1940.
[33] Interstate Commerce Commission, Statistics of Oil Pipe Lines, 1921-37, Washington, February 1939.

JOINTLY OWNED CRUDE OIL PIPE LINES

In order to lessen competition and to make their crude oil transportation more profitable, 8 of the 20 major oil companies have combined with 1 or more other majors to build and use the facilities on a common basis.[34] No independent has any interest in these lines. These pipe lines are located in the Mid-Continent area, serving the majors' refineries on the Gulf coast.

THE CONTROL OF OIL TANKERS BY MAJOR OIL COMPANIES

It has already been mentioned that tankers furnish the lowest cost of all transportation, being about half as much as pipe lines. No crude oil pipe lines run from the Mid-Continent fields to the Atlantic seaboard. Most of the tanker movements of crude oil and refined products is from the Pacific coast and Gulf ports to the refineries of the major oil companies on the Atlantic seaboard. There are no independent refiners located on the Atlantic seaboard. Table 5 indicates the ownership of oil tankers. The five majors which do not have tankers operate in the Midwest area almost exclusively. From this table it can be seen that 15 major oil companies owned 87.2 percent of the dead-weight tonnage of oil tankers as of September 30, 1938. Only a small part of the 12.8 percent are owned by independent oil companies, but for the most part they are owned by oil transporting companies.

THE OIL TANKER POOL

Just as the pipe lines have been controlled by the majors, so has the use of tankers been a further control. The rapid development of tankers has been during the past 15 years. They are used extensively in export and import trade of oil, transporting from 70,000 to 165,000 barrels at a time. Similar problems to pipe lines are encountered by the independents in that it is necessary to build excessive storage facilities so as to store enough crude oil or gasoline to make a shipment.

In the summer of 1932 a number of major oil companies formed a so-called "Oil Transport Management Conference," which was essentially a tanker pool and was finally embodied in two agreements dated September 10, 1932. One of these agreements set up a basis under which all the tank steamers under the American flag would join a pool to stabilize the oil tanker business and theoretically place the tankers in the category of common carriers. The other agreement provided the conditions under which pool members and others were to use these oil tankers. Briefly, the plan consisted of operating the tankers so that the major oil companies owning tankers, who were members of the pool, would have tankers at one rate, and the independent oil operators, who owned no tankers, would pay a rate twice as high, the difference between the two rates being given to major companies as a rebate.[35] The following paragraph is a résumé of Mr. Louis J. Walsh's analysis of the tanker pool.[36]

[34] Interstate Commerce Commission, annual reports submitted by pipe line companies for the year ended December 31, 1939.
[35] Statement of Louis J. Walsh, hearings before the Temporary National Economic Committee, Part 14, p. 7574.
[36] Idem.

TABLE 5.—*Dead-weight tonnage of oil tankers under American registry owned by major oil companies, September 30, 1938*

Name of company	Dead-weight tonnage [1]	Percent of total	Cumulative percentage
Standard Oil Co. (New Jersey)	957,792	23.0	23.0
Socony-Vacuum Oil Co., Inc	541,921	13.0	36.0
Gulf Oil Corporation	329,090	7.9	43.9
The Texas Corporation	282,411	6.8	50.7
Sun Oil Co	231,569	5.6	56.3
The Atlantic Refining Co	202,843	4.9	61.2
Tide Water Associated Oil Co	202,108	4.8	66.0
Standard Oil Co. of California	192,942	4.6	70.6
Cities Service Co	158,580	3.8	74.4
The Pure Oil Co	124,432	3.0	77.4
Standard Oil Co. (Indiana)	113,031	2.7	80.1
Union Oil Co. of California	105,434	2.5	82.6
Consolidated Oil Corporation	101,712	2.4	85.0
Richfield Oil Corporation [2]	68,780	1.7	86.7
Continental Oil Co	22,005	.5	87.2
15 major companies	3,634,650	87.2	
All companies	4,168,450	100.0	

[1] Capacity for carrying dead weight or the difference between load displacement and light displacement.
[2] Controlled by Consolidated Oil Corporation and Cities Service Co., through stock ownership, debentures, and warrants.

Source: U. S. Maritime Commission, Division of Research, Special Report 2838, Washington, October 1938.

It was a pool of only 16 percent of the tanker business of the member major oil companies. Each of the majors was to give to the pool 16 percent of its oil transporting trade and reserve outside of the pool, vessels adequate to handle 84 percent of the business, which tankers had previously operated at cost. The pool management was to operate vessels over the tonnage required to move 84 percent of the member companies' business, if all this tonnage was required to move the 16 percent remaining business. If not required, certain tankers were to be laid up so as to produce a balance between requirements of supply and demand. For the tankers laid up, the owners were to receive a fee calculated on a barrel basis sufficient to cover their "lay-up" charges. All users of the pool tankers were to pay 42 cents per barrel, the difference between that price and the cost of about 17 cents being used to pay the laid-up tanker charges and as a profit to the pool members. Thus an independent oil shipper not owning a tanker would have to pay 42 cents per barrel for his transportation, whereas a member's cost would be about 17 cents for 84 percent of his transportation, 42 cents for 16 percent, or an average of about 21 cents per barrel—just about one-half the transportation cost of the independent.

Tanker rates on No. 2 fuel oil from the Gulf coast to the Atlantic seaboard increased 400 percent (20 to 80 cents per 42-gallon barrel) from September 16 to December 16, 1940. During the same period the Gulf coast price of No. 2 fuel oil decreased, but the price for the same grade on the Atlantic seaboard increased rather sharply. The Defense Commission denied that this situation was due to the defense program, explaining that these price increases were not due to a shortage of tankers, inadequacy of storage stocks, or increases in operating costs.[37] Since the majors which market on the Atlantic seaboard operate their own tankers and account for over 90 percent of the fuel-oil business, it is difficult to see how the increases in published tanker rates could justify the greatly increased fuel-oil prices.

[37] National Defense Advisory Commission, Press Release 332, January 2, 1941.

SUMMARY AND CONCLUSIONS

The major oil companies have their greatest control in the transportation of crude oil. They have 85 percent of the crude oil trunk lines and 87 percent of the oil tankers, which offer by far the lowest cost transportation. Even though interstate pipe lines have been declared common carriers by law, shipping restrictions in the way of excessive rates over costs and high minimum tenders have prevented most of the independents from using them. This makes it possible for the majors to control the crude oil market and assures them a regular supply of crude oil from the wells to their concentrated refining centers. Furthermore, the unusually high earnings made by the pipe line companies have been used to subsidize other divisions, especially marketing. The control of transportation today by the majors appears in many respects to be just as complete and effective as was the case of the Standard Oil Trust.

CHAPTER V

REFINING

THE FUNCTION OF REFINING

The function of oil refineries is to manufacture petroleum products from crude oil, which has no other commercial value excepting the heavier crude oil of California, used to a limited extent for boilers. A discussion of the technical aspect of refining is not to be covered other than to point out the basic principles of refining.[1]

The principles of oil refining are simple, but in the large plants they are very complicated and technical, owing to a variety of processes. The simplest description is that crude oil is put in a still or tank and heat is applied under the still. When this is done, the crude oil gives off vapors which pass through condensers, which have a series of openings from which the different products pass to water-cooled condensers and then to the storage. Gasoline is the lightest and passes off first with the least heat, next comes kerosene, then gas oil, and finally lubricants. The large refineries of the majors have advanced processes which depart from this basic fundamental. The demand for gasoline has increased greatly during the automotive era, and processes have been developed to increase the recovery of gasoline from crude oil. Evidence of this is that the recovery of gasoline in 1920 was 26.06 percent of the total; in 1939 it was 44.9 percent. This has been due mainly to the cracking process; that is, breaking down under heat and pressure some of the heavier products into gasoline. Cracking and other processes have been developed intensively by the majors and are best adapted to large-size units.

The summary of percentage yields of refined products is given in table 6. Although the average recovery of gasoline is about 45 percent today, there is a wide range for different areas and refineries. For example, in 1937 the average yield in California was only 33.2 percent, while the average of the Chicago area was 55.6 percent. This varies even more by types of refineries. Therefore, the recovery of gasoline is rather flexible, depending on demand, kind of crude oil, and type of refinery used.

TABLE 6.—*Percentage distribution of the recovery of refined products from crude oil in 1938*

Product	Percent of total	Product	Percent of total
Gasoline	44.3	Lubricants	2.6
Kerosene	5.5	Other products	[1] 9.3
Gas oil and distillate fuel oils	13.0		
Residual fuel oils	25.3	Total	100.0

[1] Does not represent the 1 percent excess rerun of gasoline and other refined petroleum products over the percentage produced.

Source: U. S. Bureau of Mines, Crude Petroleum and Petroleum Products, 1939, p. 49.

[1] For a thorough discussion of the technical aspect of petroleum refining, see H. S. Bell, American Petroleum Refining, D. Van Nostrand Co., New York, 1930.

THE LOCATION AND CONCENTRATION OF PETROLEUM REFINING

During the early period of the oil industry the location of refineries was influenced to a considerable extent by the development of new oil fields, but by the use of inexpensive transportation facilities the major oil companies have developed refining centers. On January 1, 1940, there were 547 refineries located in 34 States. However, some of the States have comparatively little refining capacity; 10 States have 90 percent of the total operating capacity, with Texas and California having 50 percent of the total.[2] Furthermore, the Gulf coast has 27 percent of the refining capacity, California has 21 percent, and the east coast has only 15 percent. This reflects the importance of tanker and pipe line transportation in the location of the industry.

The range in the size of operating plants is given as of January 1, 1938, in table 7. This table indicates that most of the capacity is in the large units. No independent has any comparatively large refinery. The majors who own the large refineries get the advantages of mass production and turn out as many as 300 different products.[3]

While smaller refineries can be constructed with approximately the same physical efficiency as large ones, the economic advantages of large-scale operations in concentrated markets, or on the seaboard, have tended to develop refining on a mass-production basis. Independent refiners are usually located in or near the oil fields because of transportation disadvantages, and their market is limited.

TABLE 7.—*Frequency distribution of the size of petroleum refineries, Jan. 1, 1938*

Range of daily capacity	Percent of total	Range of daily capacity	Percent of total
Under 10,000	21.3	50,000 to 99,000	12.9
10,000 to 24,000	25.6	Over 100,000	24.9
25,000 to 49,000	15.3	Total	100.0

Source: Joseph E. Pogue, Economics of the Petroleum Industry, Chase National Bank, New York, 1939, p. 36.

During the period from 1928 to 1930 the majors acquired independent refiners located on the Atlantic seaboard. Standard Oil Co. (New Jersey) bought Beacon Oil Co.; Continental Oil Co. purchased Prudential Oil Corporation; Shell Union Oil Corporation bought New England Oil Refining Co.; and Cities Service Co. purchased Warner-Quinlan Co. These purchases left no independent refiners on the Atlantic seaboard. So today there are no independent refiners on the Atlantic seaboard and only 16 on the Gulf coast.

Texas had 101 operating refineries on January 1, 1940, with a combined daily capacity of 1,289,925 barrels per day, which included 29 refineries on the Gulf coast with a combined capacity of 1,034,600 barrels per day.[4] Compared to this, 9 major oil companies have 13 refineries located on the Texas Gulf coast with a combined daily capacity of 901,000 barrels per day. This represents 90 percent of the capacity in this area or 71 percent of the capacity of all Texas.

[2] U. S. Bureau of Mines, Petroleum Refineries, Including Cracking Plants, Washington, January 1, 1940.
[3] See the Texas Co., Petroleum Products, New York, 1939.
[4] U. S. Bureau of Mines, Petroleum Refineries, Including Cracking Plants, Washington, January 1, 1940, pp. 25–28.

The size of these major refineries ranges from 25,000 to 135,000 with an average of 77,000 barrels per day. On the other hand, the average of the 16 independent refineries in this area is only 8,000 barrels per day.

THE OWNERSHIP OF REFINERIES AND CRACKING PLANTS BY MAJOR OIL COMPANIES

The major oil companies had 65.5 percent of the crude-oil refining capacity on January 1, 1926, and 75.6 percent on January 1, 1938, which indicates a growth in concentration of 10.1 percent; and they all have cracking plants which amounted to 85.2 percent of the total on January 1, 1938.[5] The few independents who do have cracking plants must pay royalty to the majors who control the patents on cracking. The Standard Oil Co. (New Jersey) has 10 percent of the crude-oil and cracking capacity, through refining subsidiaries. Six majors own 45.2 percent of the crude-oil capacity and 53.5 percent of the cracking capacity.[6]

THE CONSEQUENCES OF OIL CRACKING PATENT MONOPOLIES

The control of patents is one of the strongest weapons the majors have in refining. They apply the profits received from independents who pay them substantial royalties when their patents are used. The majors are able to harass independent refiners for alleged infringement of patents. On the other hand, the independent refiner does not have sufficient capital to defend himself in court through long and expensive litigation.

The tendency of the major group is to own their patents through jointly owned companies. For example, the Hydro Patents Co. is jointly owned by the Texas Corporation, the Pure Oil Co., the Standard Oil Co. (Ohio), Skelly Oil Co., Gulf Oil Corporation, and Standard Oil Co. (Indiana); the five other important patent companies are each owned jointly by from two to five majors. This suggests their ability to solve the problem of the use of patents. All the majors own jointly or are affiliated with oil patent companies. The independents do not own patents, but by paying high royalties may usually use them. To that extent the majors are at a competitive advantage and can exercise considerable control over the independent refiner.

Table 8 gives some indication of the extent to which the major oil companies are affiliated with oil patent companies. Standard Oil Co. (New Jersey) is by far the most prominent company in this respect, its main control being in the cracking processes and through its one-half interest in Ethyl Gasoline Corporation.

In a recent licensing agreement among Universal Oil Products, the Texas Corporation, Gasoline Products Co., and several others, Universal Oil Products Co. purchased nonexclusive licensing rights under patents owned by the others. This action ended much patent litigation among the majors and prevented the possibility of nullifying the patents.[7] It is now extremely rare to hear of two majors suing each other for patent infringement. However, numerous independents are sued or threatened.

[5] U. S. Bureau of Mines. The percentage is based on the annual survey of petroleum refineries, including cracking plants.
[6] Hearing before the Temporary National Economic Committee, Part 14-A, pp. 7801 and 7802.
[7] William J. Kemnitzer, op. cit., p. 1.

TABLE 8.—*Affiliation of major oil companies with oil patent companies*

Name of company	Number of companies with which affiliated	Name of company	Number of companies with which affiliated
Standard Oil Co. (New Jersey)	10	Phillips Petroleum Co	4
Cities Service Co	2	The Atlantic Refining Co	4
Socony-Vacuum Oil Co., Inc	5	The Pure Oil	4
Standard Oil Co. (Indiana)	8	Union Oil Co. of California	4
Standard Oil Co. of California	2	The Ohio Oil Co	1
The Texas Corporation	7	Sun Oil Co	2
Gulf Oil Corporation	2	Continental Oil Co	2
Shell Union Oil Corporation	3	Mid-Continent Petroleum Corporation	2
Consolidated Oil Corporation	2	The Standard Oil Co. (Ohio)	1
Tide Water Associated Oil Corporation	1	Skelly Oil Co	1

Source: William J. Kemnitzer, Rebirth of Monopoly, Harper & Bros., New York, 1938, p. 173. Data are based mainly on "Pooling of Patents," U. S. Cong., pt. IV of the hearing on H. R. 4523 in 1936.

THE REFINERY "PRICE SQUEEZE"

East Texas affords the best example where the refinery price squeeze occurred. It was discovered by an independent and generally speaking the property of the field was owned by a comparatively large number of individuals. A rush to this field was made by the independents. The cost of production was so comparatively low that the independent producers and refiners continued to produce and compete with the majors, although the price of crude oil had dropped very sharply. The independents were willing to operate on a very narrow margin and depended on volume. The majors claimed that there was waste, but it appeared to be economic rather than physical waste.

After the proration system, which the majors sponsored, was in effect, the situation was much different. Prior to this, many of the independent refiners could supply all the crude oil they needed from their own wells, but now they were forced to buy most of their crude oil on the open market.[8] The price that the independent had to pay for crude oil and receive for gasoline was determined by the posted prices of the majors. In order to control or eliminate these independents, the majors applied what is known as the refinery "price squeeze" by posting the price of crude oil high while the price of gasoline remained relatively low. This is especially indicated by table 9.

TABLE 9.—*Ratio of crude oil and gasoline prices in East Texas, 1933–37*

Year or month	Crude oil prices in dollars per barrel [1] (1)	Gasoline prices in cents per gallon [2] (2)	Ratio [3] (1)÷(2)×100 (3)	Year or month	Crude oil prices in dollars per barrel [1] (1)	Gasoline prices in cents per gallon [2] (2)	Ratio [3] (1)÷(2)×100 (3)
1933	0.65	3.1	21.0	1937—Con.			
1934	1.00	3.7	27.1	May	1.29	5.3	24.3
1935	1.00	4.4	22.7	June	1.35	5.3	25.4
1936	1.14	4.8	23.7	July	1.35	5.2	26.0
1937:				August	1.35	5.2	26.0
January	1.15	4.6	25.0	September	1.35	5.1	26.4
February	1.27	4.7	27.0	October	1.35	4.9	27.5
March	1.27	4.8	26.4	November	1.35	4.6	29.3
April	1.27	5.2	24.4	December	1.35	4.2	32.1

[1] Posted prices in dollars per 42-gallon barrel for 40° A. P. I. gravity and above at wells.
[2] Quoted prices per gallon of gasoline, 62 octane and below, at refinery; from March to December 1937 prices are for 60-62, 400 c. p. gasoline.
[3] This is the formula used for determining the ratio of gasoline and crude oil prices as a part of the N. R. A. oil code.

Source: National Petroleum News, Cleveland Oil Price Handbooks, 1933 to 1937.

[8] Compare observations made by Dorsey Hager, op. cit. He points out on p. 280: "Many small refineries are forced to cease operations at such times, for when crude oil is scarce a small concern without its own oil supply cannot obtain enough oil to enable it to operate without paying high premiums for crude oil."

This table shows that the ratio of the price of crude oil the independent bought and the gasoline he sold increased from 21.0 to 32.1. It is to be noted that Standard Statistics, Inc., in its survey of the petroleum industry made a long-term forecast as follows: "At some future date, a distinct price squeeze on the refining division is quite possible." [9] In 1939 this comment was made: "Because of the price squeeze which has already taken place in the refining division * * *" [10]

MORTALITY OF EAST TEXAS INDEPENDENT REFINERS

When the great East Texas oil field was discovered in 1930 local people began to build refineries. During this period up to January 1, 1938, 155 independent refineries had been built in the field and only 1 by a major. The greatest number located there at any one time was 74 on January 1, 1935. Today there are only 3 independent refiners operating in the field. These figures are taken from the annual refinery statistics of the United States Bureau of Mines. This extremely high mortality was due to the refinery price squeeze and proration laws. It must be remembered that the majors can buy oil from many sources and the effects of proration are not the same as to the independents who could not buy or produce enough of their own oil under the laws to keep their refineries going. Table 10 shows how the capacity of the majors grew while the independents declined. Furthermore, the operating capacity of the majors' refineries connected by pipe lines with the East Texas field was over 99 percent of full capacity. Changes in the maximum daily refinery capacity of East Texas independent oil companies as compared with major oil companies' maximum refinery capacity located in territory where the supply of crude oil from East Texas field was available is included.

TABLE 10.—*Contrast of refining and cracking capacity of the major and independent groups, Jan. 1, 1932, to Jan. 1, 1938*

Date	Straight-run capacity		Cracking capacity	
	Majors	Independents	Majors	Independents
Jan. 1, 1932	714,600	71,000	----------	----------
Jan. 1, 1933	668,100	63,700	457,650	4,000
Jan. 1, 1934	671,100	113,900	489,550	21,500
Jan. 1, 1935	767,500	171,750	529,650	28,500
Jan. 1, 1936	789,000	200,200	524,550	39,750
Jan. 1, 1937	889,000	162,900	523,750	32,200
Jan. 1, 1938	943,000	91,355	(1)	(1)

[1] Comparable statistics not available since beginning on Jan. 1, 1938, cracking capacity is measured in terms of cracked gasoline production; in previous periods it was the throughput of fresh charging stock.

Source: U. S. Bureau of Mines, annual surveys of petroleum refineries, including cracking plants.

RATIO OF CAPACITY OPERATED—INDEPENDENTS CONTRASTED WITH MAJORS

In addition to strategic location of refineries and control of the more efficient types of cracking plants, the majors enjoy whatever advantages that result from large-scale operations and operating at a high percent of capacity. Table 11 shows the contrast of the refining

[9] Standard Statistics, Inc., Standard Trade and Securities, New York, June 2, 1937, vol. 84, No. 18, sec. 2, p. 37.

[10] Ibid., February 9, 1940, vol. 95, No. 95, sec. 3, p. 21.

activity of the majors and independents. It indicates also that the independents operate at less than 50 percent capacity and must therefore have more interest on their property to pay per barrel of oil refined.

TABLE 11.—*Refinery operations of the major oil companies and independents, 1926 and 1937*

[Units in barrels]

Year	20 major oil companies			Independent oil companies		
	Crude-oil capacity [1]	Runs to stills	Percent of capacity	Crude-oil capacity [1]	Runs to stills	Percent of capacity
1937	1,146,994	977,016	85	420,637	206,424	49
1926	681,619	555,064	81	359,714	224,200	62

[1] Maximum daily crude-oil throughput as of Jan. 1, inflated to annual refinery capacity basis.

Source: U. S. Bureau of Mines; compiled from the annual surveys on petroleum refineries for 1937 and 1926; also appendix, table 13, p. 76.

GASOLINE BUYING POOLS—PURPOSE AND EFFECT

The purpose is to stabilize the price of gasoline at the refineries and prevent what is known as "distress" gasoline or overproduction from entering the market. The general practice of the majors was to buy this gasoline at a price slightly higher than that prevailing on the market and then put it in storage or otherwise stabilize the market. This program of the majors kept this gasoline from getting to the consumer through independents. The following news item is typical of the way this buying was done: [11]

Buys bulk gasoline.—Approximately 600 tank cars of gasoline have been purchased by Gulf Refining Co. from independent refiners in north and west Texas. This purchase has had a stabilizing effect on the market, serving to halt the downward trend of prices in north Texas.

THE PACIFIC COAST CARTEL

This plan was started in 1929 by the major oil companies. Besides an agreement to maintain prices, the scheme was to consist of an arrangement for the collective purchase by the majors of surplus gasoline manufactured by the independent refiners if they would maintain prices mutually agreed upon.[12] A consent decree was entered on September 15, 1930, whereby the defendants were enjoined from "cooperation" in this manner.[13] The Department of Justice later acquiesced in a modification of the "Long pool" consent decree on September 25, 1933. This proposal to reestablish the pool was to be an agreement under the N. R. A. oil code. The Department took the position that the cartel approved went far beyond the provision of the Oil Code and proceeded later to get new indictments irrespective of their membership in the pool. The majors did not care to go to court and the organization was dissolved. The Department of the Interior opposed the Department of Justice's position in this matter.[14] Later the

[11] Wall Street Journal, New York, March 1, 1929, p. 11.
[12] Myron W. Watkins, op. cit., p. 232.
[13] *United States* v. *Standard Oil Co., et al*, Final Decree, In Equity No. 2542-K, in the U. S. District Court, for the Northern District of California, Southern Division.
[14] Department of the Interior, press release, March 29, 1934. It said: "These indictments have had the effect of once more throwing the oil industry on the Pacific Coast into a state of chaos."

Pacific Coast Petroleum Agency was formed, which had some features of the old cartel, but did not fix uniform prices for its several members, although this did result in actual practice due to the close cooperation of the members. Seven majors were members of the agency and the distinctive feature of it was the buying pool. The enforcement of it was interesting. In simple terms it meant that members of the cartel agreed to boycott all service stations not handling gasoline produced in accordance with the refinery restriction program. This was especially effective because of the divided dealer stations. Usually a station did not handle the brand of a single refiner exclusively.

THE MID-CONTINENT BUYING PROGRAM

This is one of the best known conspiracies of the majors to stabilize the refinery gasoline market and prevent surplus gasoline from being sold competitively. During the life of the Oil Code the Administrator permitted a stabilization program whereby the majors could buy distress gasoline from independent refiners and control the tank car prices. After the N. R. A. the majors operating in the Midwest continued this program, whereby each major would buy a certain percentage of gasoline from designated refiners and a statistical committee would report the location and amount of the surplus gasoline. Mr. C. E. Arnott, vice president of Socony-Vacuum Oil Co., Inc., was head of the general stabilization committee. The ultimate aim of the majors was to raise the price to the jobbers and consumers, and there is no evidence that the majors tried to get the independents to produce less gasoline.[15] The majors profited as long as they could buy at such low prices and raise their prices to the consumer.

LESSENING OF COMPETITION THROUGH EXCHANGING OF GASOLINE

It is a common practice of the major oil companies to exchange gasoline with each other. All majors exchange gasoline, except Sun Oil Co.[16] This is usually done when a major finds it advantageous to obtain gasoline on an exchange basis from another company rather than to make shipments from its own sources. Through these exchanges transportation costs are saved. The principle is that a major supplies other majors gasoline for their marketing outlets which are near his own refinery in turn for gasoline needed at his own marketing outlets which are located at distant areas. The amounts exchanged usually balance out at the end of the year. It is not exchanged on a price basis. Supplies so received are usually sold under the brand name of the receiving company. In some cases exchanges of gasoline may be made under the receiving company's specifications. Sometimes the gasoline may receive further treatment and blending.

In 1937 over 96 percent of the gasoline received by major oil companies on an exchange basis was from other majors. In the same year 36,750,483 barrels of gasoline were received by major oil companies on an exchange basis,[17] which is 7.3 percent of the 1937 gasoline consumption.

[15] *United States* v. *Socony-Vacuum Oil Company, Inc. et al*, Supreme Court of the United States, May 6, 1940, p. 10 (310 U. S. 150). This opinion, in favor of the Government, sets forth in sufficient detail the facts relating to the concerted buying program.

[16] Hearings before the Temporary National Economic Committee, Part 14-A, pp. 7808-7811. These statistics were supplied by the oil companies for 1935, 1936, and 1937, and individual company exchanges were reported.

[17] Ibid, p. 7811.

SUMMARY AND CONCLUSION

Because of the increasing technical nature of refining in recent years it has tended to be concentrated in large plants. A definite characteristic is that the majors control the large plants and account for over 85 percent of the production. The location of these plants combines the advantages of pipe lines for regular crude oil supplies and economical access to markets through low cost water transportation. This eliminates the necessity of shifting with new discoveries of crude oil. The independent refineries are very small and located in or near the oil fields. Their mortality has run very high, as is so well illustrated by the example of the East Texas field. The main reason for this has been a lack of crude oil and transportation facilities. There is sufficient evidence to indicate that the policy of the majors has been to prevent the independent from getting adequate crude oil supplies through the refinery price squeeze and by their control over pipe lines.

Furthermore, the majors have purchased up surplus gasoline from the independents to prevent it from entering the market through independents and to maintain a stabilized price structure.

Virtually all the patents for refining oil are owned by the majors, usually through jointly owned companies. Some independents do obtain licenses for patents after paying considerable royalty.

CHAPTER VI

GASOLINE TRANSPORTATION

THE PURPOSE AND GROWTH OF GASOLINE PIPE LINES

The growth of gasoline pipe lines has been very rapid during the past 10 years. There were over 8,000 miles on January 1, 1940, as compared to 236 miles in 1929.[1] Many new lines and extensions are being built today. For the most part they bring gasoline from the Mid-Continent area to the industrial areas of the Great Lakes and from the refining centers of the Atlantic seaboard to inland points. The primary purpose in developing them was to expand markets and furnish a very cheap form of transportation. The cost of transporting gasoline in pipe lines is about the same as crude oil—just about half that of the rail rate. Therefore, as a result of building gasoline pipe lines, the majors have expanded their markets and are able to give real price competition to the independents. There is practically no physical difference in crude oil and gasoline lines, except location and the fact they are not used interchangeably. However, in rare instances a gasoline line may be converted into a crude oil line. Recently a pipe line transporting gasoline from near Casper, Wyo., to Kansas City, Kans., was converted into a crude-oil line. The main expense in converting a crude-oil pipe line into one for gasoline is the cleaning.

The investment in gasoline pipe lines has increased rapidly since 1929, amounting to over $44,000,000 at the end of 1938. The amount of income was over $13,000,000 or an average return of 29.7 percent, just slightly higher than the earnings of crude-oil lines. The gasoline transported by major oil companies through their pipe lines increased from 3,000,000 barrels in 1929 to 89,000,000 barrels in 1938.[2]

THE OWNERSHIP OF GASOLINE PIPE LINES BY MAJOR OIL COMPANIES

As of December 31, 1938, the majors owned 96.1 percent of the mileage of gasoline lines.[3] Only one independent, the Champlin Refining Co., has a gasoline pipe line, which consisted of about 250 miles in 1938. All of the 20 majors have gasoline pipe line facilities, except Gulf Oil Corporation and the Ohio Oil Co. Gulf Oil Corporation uses its tankers to offset this and brings considerable gasoline to the Atlantic coast from its large refinery at Port Arthur, Tex.; the Ohio Oil Co. markets in a comparatively small area, mostly in Ohio, and uses the pipe lines of the other majors.

CONTROL OF OTHER TRANSPORTING FACILITIES

The control of tankers has already been indicated. Generally speaking, tankers can be used interchangeably and be shifted from

[1] Appendix, table 17, p. 85: supplemented by statistics on new lines completed, National Petroleum News, transportation issue, Cleveland, December 13, 1939.
[2] Hearings before the Temporary National Economic Committee, Part 14-A, p. 7798.
[3] Ibid, p. 7729.

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transporting crude oil to gasoline with a minimum of effort. Ten of the majors have huge refineries located on or near the Texas Gulf coast. A very substantial part of this gasoline production is moved to the Southern States and as far up as Maine by tankers. Adequate storage facilities have usually been built by the majors at the more important port cities.

The movement of crude oil and gasoline over the inland waterways is made by barges. Although separate figures as to the ratio of crude oil and gasoline transported are not available, it appears that barges are used mostly for gasoline. At the end of June 1939, 14 major oil companies owned 72 percent of the gross tonnage of barges owned by oil companies.[4]

Tank cars move by far the greatest portion of gasoline to the marketer, taking into consideration the shorter movement. On January 1, 1939, there was a total of 146,399 tank cars in petroleum service, only 12,365 of which were owned by the railroads.[5] Although varying with each company, the practice of the majors is to lease most of their tank cars. The Standard Oil Trust owned its tank car facilities through Union Tank Car Co. After the break-up of the trust it began to lease the cars it needed. Most of the tank cars are owned by four large companies which lease them. The major group own 43,789 or 30.2 percent of the total.[6] It does not appear that there is any control of tank cars by the majors, since any oil company can lease all it needs.

MILEAGE JOINTLY OWNED BY MAJORS

Great Lakes Pipe Line Co. is jointly owned by 8 of the 20 major oil companies and is one of the best examples of collective ownership. The distribution of stock ownership is given in table 12.

TABLE 12.—*Distribution of stock ownership of Great Lakes Pipe Line Co. on Dec. 31, 1938*

Name of company	Shares	Percent	Name of company	Shares	Percent
Continental Oil Co	40,035	29.2	Consolidated Oil Corporation	8,064	5.8
Mid-Continent Petroleum Corporation	26,016	19.0	Cities Service Co	7,073	5.2
Skelly Oil Co	19,508	14.2	Phillips Petroleum Co	6,847	5.0
The Texas Corporation	16,665	12.1	Total	137,223	100.0
The Pure Oil Co	13,015	9.5			

Source: Annual report of Great Lakes Pipe Line Co. to the Interstate Commerce Commission, Dec. 31, 1938.

This pipe line is 2,134 miles in length, extending from near Tulsa, Okla., to St. Paul, Minn., and Chicago, Ill. This mileage represents over 25 percent of all gasoline lines and is an exceptionally important factor of these companies' marketing advantage in the Midwest area. This point will be covered under marketing and basing points. The investment in carrier property of the Great Lakes Pipe Line Co. was $17,966,709 (or 41 percent of the total gasoline pipe-line investment) at the end of 1938, and a rate of return of 31 percent[7] which is con-

[4] Based on the List of Inspected Tank Vessels, June 30, 1939, Department of Commerce, Bureau of Marine Inspection and Navigation, and World Petroleum Register, 1940.
[5] American Petroleum Institute, Petroleum Facts and Figures, New York, 1939, p. 103. Data authority is Union Tank Car Co.
[6] Compiled from Official Railway Equipment Register, tank car section, New York, January 10, 1940.
[7] Hearings before the Temporary National Economic Committee, Part 14-A, p. 7800.

siderably higher than the return on other investments. The weighted average rate of return for all gasoline pipe lines reporting to the Interstate Commerce Commission for the same period was 29.7.

RESTRICTIONS AND NONCOMPETITIVE SPECIFICATIONS FOR SHIPPERS

As was the case of crude-oil lines, gasoline lines have been held to be common carriers under the jurisdiction of the Interstate Commerce Commission, but due to monopolistic restrictions they have for all intents and purposes prevented outsiders from using the lines. The companies have not provided adequate common carrier storage facilities. The minimum tender of 50,000 barrels prevents the typical small refiner of less than 2,000 barrels of gasoline production per day to ship under those restrictions. Furthermore, at least one of the majors, Sun Oil Co., writes a provision in its tariffs filed with the Interstate Commerce Commission that shippers may only ship gasoline of certain specifications, which appears to be the same as saying the gasoline must be the equivalent of "Blue Sonoco." It is not clear what the reason for this is, but nevertheless it would serve as a restriction, especially in the case of third grade gasoline. The answers to the questionnaires submitted by the major oil companies to the Temporary National Economic Committee showed that all but three transported gasoline in their own name.[8]

REBATES

Just as the case of crude oil lines, gasoline pipe lines have been common carriers in name only and not in fact. Furthermore, much evidence has been developed to show that major oil companies receive rebates in the form of stock dividends. The complaint of the Petroleum Rail Shippers' Association before the Interstate Commerce Commission supports this point as follows:[9]

> Because of the facts aforesaid said pipe line companies are not in fact bona fide common carriers and are dummy corporations organized by certain shippers who are owners of the stock for the purpose of receiving rebates in the form of stock dividends and for the purpose of procuring transportation of their products at a cost materially less than that paid by competitors and users of railroads for transportation of their products who are required to pay the regular tariff rate for the same service.

In the case of Great Lakes Pipe Line Co., jointly owned by eight majors, rebates have been substantial and have seriously impaired the ability of independents to compete. For example, on shipments of gasoline from Tulsa, Okla., to principal terminal points at Kansas City, Kans.; Des Moines, Iowa; Omaha, Nebr.; Chicago, Ill.; and Minneapolis, Minn.; the rebates are the differences between the pipe line costs and the corresponding tariff rates, which amount to 1.4 cents, 1.6 cents, 1.45 cents, 1.3 cents, and 1.75 cents, respectively, per gallon.[10]

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[8] Files of the Temporary National Economic Committee. Answer to question No. 19 of the Questionnaire for Oil Companies. May 1939.

[9] *Petroleum Rail Shippers' Association* v. *Alton and Southern Railroad, et al.* Complaint, No. 28106, filed Aug. 29, 1938, p. 18.

[10] *United States* v. *Great Lakes Pipe Line Company*, Complaint, Civil No. 183, filed in the District Court for the District of Delaware, September 30, 1940, pars. 10 and 11. See also *United States* v. *Phillips Petroleum Company and Phillips Pipe Line Company*, Complaint, Civil No. 182, filed in the District Court for the District of Delaware, September 30, 1940.

CHAPTER VII

MARKETING

GEOGRAPHICAL DISTRIBUTION

The majors are all engaged in marketing of petroleum products, and exercise a substantial control over this division in order to maintain the price structure and afford adequate outlets. In an attempt to eliminate competition the Standard Oil trust divided the United States into 11 marketing districts, each one being placed under the control of a marketing subsidiary. The territories did not overlap and for the most part followed political rather than economic lines.[1] For instance, Standard Oil Co. of New York was the distributor for New York and New England; The Standard Oil Co. of Ohio had all of Ohio; and Standard Oil Co. (Indiana) had a group of 10 North Central States. The dissolution decree of 1911 did not affect this set-up to any large degree.[2] The Federal Trade Commission found in 1915 and 1920 that this marketing arrangement was not changed very much.[3] The Atlantic Refining Co. was an exception. However, since 1911 other majors have been organized and operate over much wider areas. For example, Texas operates in all States, Shell in 47, and Consolidated in 43 States.[4] The number of major oil companies operating in the different States ranges from 5 to 16, the modal number being 11. In terms of volume the leading major in each State accounts for 23 percent of the domestic sales, ranging from 11.7 percent in Kansas to 61.5 percent in Utah.[5]

OWNERSHIP OF MARKETING FACILITIES BY THE MAJORS

There were 197,568 regular service stations in the United States in 1935 according to the Bureau of the Census.[6] This figure does not include indirect outlets such as garages and country stores. Eighteen of the major oil companies owned 75,547 service stations [7] at the end of 1935. On this basis the major group owns only 38 percent of all service stations in the United States. On the other hand the same majors owned 19,609 bulk plants [8] at the end of 1935. When compared to the total figure of 27,333 bulk plants as reported by the Census [9] for 1935, it shows that the majors have 73 percent of the total. Figures

[1] George W. Stocking, The Oil Industry and the Competitive System, Houghton, Mifflin Co., New York, 1925, p. 70.
[2] David Levine, The Petroleum Industry—A Study of Its Interstate Aspects, Work Projects Administration Official Project No. 461-97-5-7, mimeographed, New York, 1938.
[3] Federal Trade Commission. Report on the Price of Gasoline in 1915—pp. 22 and 24; and Report on the Advance in Price of Petroleum Products, pp. 50-54, Washington.
[4] Appendix, table 19, p. 88-89.
[5] Appendix, table 23, p. 94.
[6] Census of Business: 1935—Retail Distribution, U. S. Bureau of the Census, vol. IV, p. 13.
[7] Appendix, table 21, p. 90.
[8] Appendix, table 20, p. 90. A bulk plant is a storage station, consisting of one or more tanks and a loading rack, and usually a warehouse, located within trucking distance of the retail outlets.
[9] Census of Business: 1935—Wholesale Distribution, U. S. Bureau of the Census, vol. II, p. v.

for Standard Oil Co. of California and Mid-Continent Petroleum Corporation are not available.

CONTROL OVER JOBBERS

The function of the jobber is to buy gasoline in tank carlots and supply service station operators. Practically none of the sales of independent jobbers are made to commercial consumers. The main control over jobbers has been through the narrowing margins and pressure to operate as an agent or exclusive distributor for majors only. In the main, price and marketing policies are dictated by the majors. There are approximately 8,000 jobbers in the United States, but 80 percent of these have contracts with the majors.[10] The buying programs of the majors have prevented independent gasoline from getting to these jobbers. *The Madison Oil case* illustrates that.[11]

(1) *Elimination of independent jobbers.*—From 1928 it was customary for independent jobbers to sell products under their own brand names. They bought gasoline in the open market on specification, and when the volume sold by independents became too strong the majors would lower their tank wagon prices. Since they had sufficient bulk plants in the area, no jobber could keep his price above that set by the majors. Therefore, the independent jobber had to absorb these losses or go out of business. He appealed to the independent refiner who was supplying him to give him guaranteed margin to protect him in these cases, but the typical independent refiner did not have sufficient capital to do this. Therefore, the jobber selling independent gasoline had to go out of business or sign up as an exclusive distributor or an agent for a major oil company. Most jobbers followed the latter course. The extensive advertising program of the majors and offers of credit had some inducement. After the jobbers signed contracts with the majors their margins were narrowed by the manipulation of the refinery prices by the majors.

(2) *Narrowing margins to jobbers.*—Jobber margins have been decreasing during the past 10 years through what is known as the "jobber squeeze." In narrowing the jobbers' margin the majors wanted to force the jobber to bear part of the cost of price cutting, resulting from intensified competition among retailers operating under the "Iowa plan." At any rate the margin has dropped to 1 cent and less per gallon in many areas. Weighted average prices of gasoline are not available, but compilations for Des Moines, Iowa, from 1930 to 1938, indicating the narrowing margins given by Standard Oil Co. (Indiana), are set out in table 13. Mr. Sidney A. Swensrud, in his testimony before the Temporary National Economic Committee, admitted the narrowing margins to jobbers, but said: "The reason it has been narrowing is because the costs have been declining, the costs of performing the jobbing function have been declining."[12] It is difficult to understand how these costs are lower, since there is less sales volume for each independent jobber.

[10] Testimony of Paul E. Hadlick, secretary, National Oil Marketers' Association, Washington, D. C., hearings before the Temporary National Economic Committee, Part 15, pp. 8839 and 8885.

[11] See Opinion of Justice Douglas, *United States v. Socony-Vacuum Oil Co., Inc., et al.*, Supreme Court, May 6, 1940 (310 U. S. 150).

[12] Hearings before the Temporary National Economic Committee, Part 15, p. 8110.

TABLE 13.—*Price structure of regular grade gasoline* [1] *at Des Moines, Iowa, as posted by Standard Oil Co. (Indiana), by years, 1930–38*

Year	Tank car, Tulsa	Freight, Tulsa to Des Moines	Tank car, Des Moines	Dealer	Service station	State and Federal taxes	Margins for marketing		
							Jobber	Dealer	Total
	(1)	(2)	(1)+(2)=(3)	(4)	(5)	(6)	(4)−(3)	(5)−(4)	(7)+(8)
1938	5.23	2.33	7.56	9.21	13.22	4.00	1.65	4.01	5.66
1937	5.81	2.18	7.99	9.44	13.43	4.00	1.45	3.99	5.44
1936	5.96	2.24	8.20	10.12	13.64	4.00	1.92	3.52	5.44
1935	5.37	2.22	7.59	9.43	13.33	4.00	1.84	3.90	5.74
1934	5.05	2.18	7.23	9.33	13.20	4.00	2.10	3.87	5.97
1933	4.27	2.23	6.50	9.05	11.96	4.27	2.55	2.91	5.46
1932	4.93	2.24	7.17	10.12	12.62	3.52	2.95	2.50	5.45
1931	3.84	2.18	6.02	9.42	11.74	3.00	3.40	2.32	5.72
1930	6.23	2.18	8.41	12.16	15.16	3.00	3.75	3.00	6.75

[1] Prices are in cents per gallon and do not include State and Federal taxes. Jobbers buy in tank carlots which are based on the group 3, or Tulsa, Okla., refinery prices.

Source: National Petroleum News, Oil Price Handbook, annual, Cleveland: For 1937 and 1938 service station prices are as reported by the Oil and Gas Journal, Tulsa. Freight rate data was obtained from Public Tariff Section, Interstate Commerce Commission.

(3) *Elimination of bulk plants through oil tank trucks.*—During the past few years most of the majors have followed the practice of using oil tank trucks to serve their retail outlets. An examination of unpublished statistics of the United States Bureau of Public Roads on commodity movements in interstate commerce suggests this trend. This trend has resulted in an enlargement of the radius of operation from 50 to 100 miles, increased the minimum delivery from 50 to 300 gallons, and increased the capacity of the storage tanks. The companies using these trucks make the need for the jobbing function much less, thereby eliminating bulk plants and jobbers. These trucks are able to operate within a large radius from the refinery or seaboard terminal. They are considered as private carriers by the Interstate Commerce Commission, if they do not haul for others. In addition to the elimination of bulk plants through tank trucks, restrictions in the way of basing points are being used to the competitive disadvantage of independents.

THE USE OF BASING POINT SYSTEMS

There are many basing points in the petroleum industry whereby the freight from a designated base is charged to the destination, regardless of the origin or method of transportation. The practice is somewhat analogous to the well-known practice of steel and cement companies. They are used to maintain the price structure of majors and to realize price advantages from their control of transportation and strategic refinery locations. It also makes it possible to base prices on the so-called spot market, which may easily be manipulated or controlled.

(1) *Group 3 or "Tulsa plus" basis.*—This is one of the best known basing points used by the major oil companies. Tulsa is a big crude oil market, but comparatively little of the refining of the majors is done in that area. There are some independent refiners who make quotations to trade journals, which forms a spot market. The majors' gasoline, either what they produce or what they buy on the spot market, for the most part moves to the market through gasoline

pipe lines. For example, Great Lakes Pipe Line Co. serves eight majors exclusively and moves gasoline to Kansas, Nebraska, Iowa, Illinois, Indiana, and Minnesota. Other companies marketing in this area have the crude oil moved to the market and refined there. Thus, Shell has a crude oil line extending from the Tulsa area to its refinery at Wood River, Ill., and a gasoline line from there to Ohio; Standard Oil Co. (Indiana) runs its crude oil from the Tulsa area to its huge refinery at Whiting, Ind. The price the jobber and dealer have to pay is the Tulsa tank car spot price, plus the all-rail freight rate. These companies have a definite transportation advantage which the independents must pay. If, for example, an independent does ship gasoline over the Great Lakes pipe line, the tariff would be the same as the all-rail rate. The independent jobber cannot stand this competitive advantage of the majors and has been gradually going out of business or working for the majors. The all-rail rate from Tulsa to Chicago is 2.64 cents per gallon; the cost is less than half of that, which gives more than 1 cent competitive advantage on each gallon. Gasoline moving only a few miles would have the 2.64 cents per gallon added to it as a part of the retail price.

(2) *Gulf coast bulk market.*—As already discussed, about half the majors have large refineries on the Gulf coast. How are prices set at New York Harbor and other seaboard terminals? Strangely enough, they are based on the quotations of the few small independent refiners on the Gulf coast, which is a very thin market and may easily be manipulated through the majors' buying policy. This Gulf coast price, plus transportation charges, is the tank car or jobber price at New York Harbor and other eastern seaboard cities.[13] Furthermore, it serves as a base for the prices at refining centers on the east coast where some crude oil is imported and the rest brought from the Gulf coast. The majors do not claim that their prices are based on a refinery cost analysis owing to the difficulty of computing costs.

ETHYL GASOLINE CORPORATION AGREEMENT

The Ethyl Gasoline Corporation manufactures a patented fluid called tetraethyl lead which is mixed with gasoline to raise its antiknock qualities. All majors use this fluid, except Sun Oil Co., which has a special refining process. This is a very important fluid and not obtainable by independent jobbers or refiners unless they agree to certain price policies, the main one being price maintenance as outlined by the Ethyl Gasoline Corporation in their licensing agreements. The corporation had a requirement that all licensees must sell premium gasoline 2 cents higher than the regular grade. The difference in the cost of these two grades is only 0.37 cent per gallon. Table 14 gives the tetraethyl lead content of both premium and regular grades by companies, indicating an average difference of 1.48 cubic centimeters. Therefore, since the cost to the blender is 0.25 cent per cubic centimeter [14] the difference in cost is 0.37 cent per gallon. The control of this fluid has the effect of keeping independent gasoline from the consumer, except through the majors, since straight-run gasoline is not generally satisfactory without the fluid. Standard Oil Co.

[13] Buffalo Courier-Express, January 29, 1930, p. 5. Announcement of Standard Oil Co. of New York's new price basis policy.

[14] As reported in a letter signed by E. W. Webb, president of Ethyl Gasoline Corporation, which accompanied the 2 new agreements mailed to Ethyl refiner licensees. National Petroleum News, Cleveland, June 5, 1940, p. 20.

(New Jersey) owns 50 percent of the Ethyl Gasoline Corporation and General Motors Corporation owns the other half.[15] Indirectly, E. I. du Pont de Nemours & Co. has an interest, since it owns 23 percent of General Motors Corporation.

TABLE 14.—*Tetraethyl lead content of regular and premium grades of gasoline sold by major oil companies,*[1] *1939*

Name of company	Cubic centimeters per gallon			
	Regular		Premium	
	Winter	Summer	Winter	Summer
Atlantic Refining Co. (The)	1.0	1.0	2.8	2.8
Cities Service Co	1.1	1.2	2.1	2.5
Consolidated Oil Corporation	1.3	1.3	3.0	3.0
Continental Oil Co	3.0	3.0	3.0	3.0
Gulf Oil Corporation	1.5	1.5	3.0	3.0
Ohio Oil Co	1.4	1.4	2.8	2.8
Phillips Petroleum Co	.8	1.4	2.2	2.4
Pure Oil Co. (The)	1.5	1.5	3.0	3.0
Shell Union Oil Corporation	0	0	2.2	2.2
Skelly Oil Co	1.0	1.2	2.9	2.9
Socony-Vacuum Oil Co., Inc	.8	.9	3.0	2.5
Texas Corporation (The)	1.0	1.0	2.0	2.0
Union Oil Co. of California	.4	.5	2.6	2.7
Simple average	1.14	1.22	2.66	2.66

[1] As reported to the Temporary National Economic Committee in response to question 34 (revised) of the Committee's Questionnaire for Oil Companies. See Hearings, Part 14-A, pp. 7824-7841, for other specificatons of various brands of gasoline.

The Ethyl Gasoline Corporation has followed the practice of sending agents into the field in order to determine whether or not a license will be issued and to report on "business ethics" followed by the particular companies.[16] The corporation has refused to issue licenses to a number of jobbers who were not abiding by the marketing policies prevailing in the industry, or who were not maintaining the retail prices on gasoline posted generally in their area, or whose retail dealers were not maintaining the prices.[17]

PRICE LEADERSHIP AND DIVISION OF TERRITORY FOR POSTED PRICES

The prices of gasoline to service station dealers and jobbers are posted by the majors who were a part of the Standard Oil Trust and published in certain trade journals at least once a week. For each group of States comprising a marketing territory, quite similar to that set up after the 1911 decree, the designated major is the recognized price leader and posts the prices for that territory. Before the adoption of the Iowa plan [18] service station prices were also posted. Since this plan is not in effect in Texas, Arizona, Nevada, California, Oregon, and Washington, service station prices are posted in these States.

The Atlantic Refining Co. was originally assigned Pennsylvania and Delaware as its marketing territory, but owing to the company's use

[15] Poor's Manual of Industrial Investments, New York, 1940, p. 2150.
[16] *United States* v. *Ethyl Gasoline Corporation*, stipulation in equity No. E-84-321, District Court for the Southern District of New York.
[17] Idem.
[18] This plan was started in Iowa in 1935 by Standard Oil Co. (Indiana) to avoid chain-store taxes. Instead of having salaried employees at their service stations, the company leased the stations to lessees and the employees were put on a commission basis. As a measure of this, Standard Oil Co. (New Jersey) operated 17,717 service stations in 1933 contrasted to only 417 in 1938.

of tankers and the building of a new refinery at Philadelphia about 1920, a decision was made to expand the marketing territory.[19] However, the prices are the same in the few States in which they do post prices with the leader, excepting Atlantic City, N. J., which was only one-tenth of a cent lower. Likewise, the prices of the non-Standard majors which market over a wider area are the same as the posted prices of the leader.

The effect of this division of territory lessens competition and maintains the price structure from the well to the consumer's container. It also makes more effective the advantages of refining locations and low-cost transportation advantages which are not available to independents.

Table 15 shows the division of marketing territory for the United States.

CONTROL OVER SERVICE STATION OPERATORS

The general practice of the majors is to lease their service stations to operators on a gallonage basis. This means that the operator pays the posted tank wagon price and sells at competitive prices; that is, his income is the margin between the tank wagon price and his service station price. Furthermore, the majors put definite marketing restrictions in the contract and otherwise control his operations.

TABLE 15.—*Price leaders of petroleum products and the States in which they post prices*

Price leader	States
Socony-Vacuum Oil Co., Inc.	Maine, Vermont, New Hampshire, Rhode Island, Connecticut, Massachusetts, and New York.
The Atlantic Refining Co.	Pennsylvania, Delaware, Connecticut, Rhode Island, New Jersey, Maryland, North Carolina, and Georgia.
Standard Oil Co. of New Jersey [1]	New Jersey, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, and South Carolina.
The Standard Oil Co. (Ohio)	Ohio.
Standard Oil Co. (Kentucky)	Kentucky, Mississippi, Alabama, Georgia, and Florida.
Standard Oil Co. (Indiana)	Illinois, Indiana, Michigan, Wisconsin, Minnesota, Missouri, Iowa, Kansas, North Dakota, and South Dakota.
Humble Oil & Refining Co.[1]	Texas.
Standard Oil Co. of Nebraska [2]	Nebraska.
Standard Oil Co. of Louisiana [1]	Arkansas, Louisiana, and Tennessee.
Continental Oil Co.	Colorado, Wyoming, Montana, Utah, Idaho, New Mexico, Oklahoma, Arkansas.
Standard Oil Co. of California	California, Arizona, Nevada, Oregon, and Washington.

[1] Subsidiaries of Standard Oil Co. (New Jersey).
[2] Subsidiary of Standard Oil Co. (Indiana).

Source: National Petroleum News, Oil Price Handbook, Cleveland, 1939.

(1) *The use of pilot stations.*—Most of the majors operate in a particular market what is known as a pilot station. These stations are operated by salaried employees and usually no discounts are given. A careful check is made of the sales volume which serves as an index of what the major may expect at stations operated on a gallonage basis. When it appears that a particular service station operator is not selling as much gasoline as he should, the sales manager

[19] Charles F. Wilner, "J. W. Van Dyke, The Story of a Man and an Industry," National Petroleum News, Cleveland, February 5, 1936, p. 243.

goes to see him and tells him he must increase his sales. Since virtually all leases made by the majors have a 10-day cancelation clause in them, the service station operator knows he must do one of two things—(1) obtain new trade through better sales methods, longer hours, etc.; or (2) give secret or open discounts from the usual margin of 3½ cents per gallon, out of which a 1-cent-per-gallon rental is usually paid to the company. Numerous service station operators have made the complaint that they must stand the losses caused by price wars or subnormal markets, while the majors sell on a rigid tank car basis. In Washington, D. C., Standard Oil Co. of New Jersey operates only one of its service stations; the others are leased by service station operators.

(2) *Noncompetitive supplies required to be handled.*—The major oil companies have insisted that their dealers sell all products made by the particular company if they purchase any of the products, and the principal product of each company is branded gasoline.[20] No written agreement is used in creating this arrangement, but every "100 percent" dealer knows it. For example, a 100 percent Gulf station will not be selling "Quakerstate" or other independent brands of motor oil.[21] Besides being compelled to handle noncompetitive petroleum products, the operator must handle tires and batteries of a particular brand. He must also purchase all his supplies and uniforms through the supplying major.[22]

In addition to the straight covenant not to deal in competitive products the dealer is bound to exclusive dealing by two other devices introduced into his purchasing contract; that is, by agreeing to buy his full requirements or contracting to buy a monthly or yearly minimum which exceeds any reasonable expectancy of volume to be sold at the station.

Mr. Farish, president of Standard Oil Co. (New Jersey), which has 25,000 service station outlets, admitted that his company controlled the lessees by the following testimony:[23]

The CHAIRMAN. I think that is a very frank answer, Mr. Farish, and it goes to the very heart of the control of retailing. That is exactly the complaint that the retailers made—that if they exercised their independent judgment to sell products other than those furnished by the lessor company their leases would be in danger, and you tell us that is the fact.

Mr. FARISH. I think that is the fact, certainly. If you will permit me, I don't see anything wrong with that, morally wrong with that.

UNIFORM SALES CONTRACTS TO JOBBERS

The practice of major oil companies is to make uniform contracts with jobbers, as was so clearly brought out during the recent *Madison Oil case*.[24] The indictment of December 22, 1936, against 14 major oil companies and 44 company officials, to which most of them entered pleas of nolo contendere 18 months later and paid fines totaling several hundred thousand dollars, charged in part as follows:

Commencing in 1931 numerous private meetings have been held by representatives of defendant major oil companies at which, among other things, the

[20] Federal Trade Commission, A Survey of the Controversial Marketing Practices in the Petroleum Products Retail Industry, 1939, p. 26.

[21] Hearing before the Temporary National Economic Committee, statement of Arnold W. Craft, Part 6, pp. 9171-9176. Mr. Craft gave 30 actual cases which support this conclusion.

[22] Ibid, testimony of Henry A. Crouthamel, p. 9209.

[23] Ibid, testimony of Mr. William S. Farish, p. 9723.

[24] *United States* v. *Socony-Vacuum Oil Company, Inc., et al.*, indictment No. 11364, filed December 22, 1936, in the District Court for the Western District of Wisconsin. See also majority opinion of the Supreme Court, May 6, 1940 (310 U. S. 150), which upheld the Government in this case.

subject of jobber guaranteed margins in the aforesaid Midwestern area has been discussed and debated for the purpose and with the effect of arriving at agreements and understandings whereby the same were arbitrarily fixed and made uniform. Such meetings have been held at frequent intervals in each of the years 1931 to 1936, inclusive, usually at Chicago, Ill., at the Blackstone Hotel, * * *.[25]

In or about December 1934, by agreement made and concerted action taken pursuant to and in the course of said continuing combination and conspiracy, said guaranteed margins to be allowed to jobbers in said Midwestern area were uniformly fixed at 5½ cents below the prevailing normal retail prices, subject to the reduction therefrom of one-half of the amount by which at any time the differential between the basic tank car price to the jobber (as uniformly defined in said jobber supply contracts), and the normal retail price might be less than 5½ cents. In certain States in which the Standard of Indiana has recently discontinued the posting of retail prices, such jobber margins have, pursuant to said agreement, been calculated on the basis of a margin of 2 cents below the dealer tank wagon prices posted by the Standard of Indiana.[26]

In addition to the agreements and concerted action of the major oil companies, the same indictment charged that they adopted by concerted action the following: (1) Uniform duration of 1 year; (2) uniform provisions for determining the basic price on the quotations of certain trade journals; (3) uniform provisions to the effect that all gasoline should be sold only on the basis of all-rail delivered prices, f. o. b. Tulsa, Okla., irrespective of the actual origin and method of transportation used; (4) and uniform provisions for fixing minimum prices, volume to be sold, and prohibitions against protection from price cuts.[27]

This indictment shows very clearly the element of cooperation among the majors in dealing with jobbers. The Midwestern area covered by the practices accounts for a little more than 25 percent of the gasoline consumption in the United States. The Supreme Court upheld these convictions on May 6, 1940.[28]

EXCLUSIVE CONTRACTS AND PRICE DIFFERENTIALS

The majors use certain tactics to obtain exclusive dealer arrangements. The primary aim of this is to keep independent products off the market, especially lubricants and automotive equipment. All the majors follow the policy of charging one-half cent more per gallon to the divided or split dealers. About 10 years ago it was common to furnish the 100 percent dealers with pumps at no cost. Later they began the practice of renting the station and then subleasing it to the operator. Under this arrangement the operator had to sell only the products of the supplying company.

Other methods or threats to obtain exclusive contracts have been (1) building a competitive service station; (2) cutting off the extra margin and giving the retail outlet's competitors an advantage in price quotations; (3) cancelation of the credit card privilege; (4) cancelation of the supply of gasoline; and (5) removal of equipment installed on the premises. The statistical data and examples of this problem, presented to the Temporary National Economic Committee by Mr. Arthur W. Ramsdall, indicate that over 85 percent of the retail outlets are controlled by the major group [29] in 1939.

[25] Ibid., par. 13.
[26] Ibid., par. 15.
[27] Ibid., par. 23.
[28] *United States* v. *Socony-Vacuum Oil Company, Inc., et al.* No. 346 (310 U. S. 150), on writs of certiorari to the Circuit Court of Appeals for the Seventh Circuit.
[29] Hearings before the Temporary National Economic Committee, Part 15-A, p. 8735.

ELIMINATION OF TRACKSIDE STATIONS

Trackside marketing of gasoline, as the name implies, means that an operator leases some land along a railroad and a short spur track is built to sidetrack tank cars of gasoline. A filling station is located very near the spur track, from which the tank cars can be emptied directly into the filling station tanks, thus eliminating all the costs of storage in a central bulk plant, as well as the cost of transportation by truck from the bulk storage plant to individual filling stations. The location of these operators is obviously not as good as regular dealers and they sell gasoline at substantially lower prices. The trackside association wanted permission under the N. R. A. code to sell at lower prices due to their special method of selling and the fact they could not sell a leaded nationally advertised product.[30]

In 1933 there were about 2,000 such outlets in the United States.[31] Considerable complaints have been received from these operators that pressure from the major oil companies has been made on the railroad companies to refuse to lease land to these trackside operators. Since the major oil companies use the railroads to a great extent, the railroads often do refuse new leases. A letter from Mr. J. J. Pelley, president, Association of American Railroads, written to 13 major oil companies on January 17, 1935, shows very clearly the association's position in this matter. The letter reads in part as follows: [32]

> Railroads in Southeastern territory will reform as rapidly as seems advisable existing leases covering railroad property used for filling station purposes. They will discourage future leases of this character, and will in no case make such leases on terms more favorable to lessees under the reformation plan. .

THE EFFECT OF NATION-WIDE CREDIT CARDS

The majors issue credit cards for their "100 percent" dealers and assume the risk involved in late or nonpayment of purchases made. Usually in States where a particular major does not market, a reciprocal agreement is made with some other major. This makes it possible for a person holding a credit card to buy petroleum products and accessories on credit anywhere in the United States, even though the company issuing the card may operate in a limited area. Two examples may be given. Standard Oil Co. (New Jersey) and Phillips Petroleum Co. each have reciprocal agreements with five other majors covering the United States.[33] This credit card policy is an inducement for a split dealer to become exclusive or 100 percent, since these credit cards bring a sizable amount of business to him at no credit risk, in addition to obtaining one-half cent higher margin.

This concerted action of the majors in the use of credit cards makes it more difficult for the independent jobber or refiner to compete, since he usually sells in a very limited area and does not have reciprocal dealings with other companies for credit. Therefore, the motorists who prefer credit usually buy gasoline from the "100 percent" major stations, especially so on long trips.

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[30] Protest on behalf of the National Association of Trackside Filling Stations, Inc., against the schedule of the planning and coordination committee suggesting prices for petroleum products, as set forth in the administrative order of October 16, 1933.

[31] Idem.

[32] Hearings before the Temporary National Economic Committee, Part 16, p. 9071.

[33] The 1940 road maps of Standard Oil Co. of New Jersey and the other marketing subsidiaries of Standard Oil Co (New Jersey) indicate the name of the company in each and every State which will honor the companies' credit cards.

The marketing division is overbuilt and the most competitive of all divisions of the petroleum industry. In general, marketing is operated at a loss by the majors, but it does afford a necessary outlet for their products which they must control in order to insure profits in other branches of the industry. The majors account for 85 percent of the domestic sales of gasoline.

The majors that were a part of the Standard Oil Trust are the market leaders and have the United States divided into 11 marketing territories. These prices are posted and published generally in the trade journals and there is virtually no price competition among the majors.

The majors have taken steps to eliminate independent jobbers through narrowing margins and pressure on them to operate as agents only. Their buying programs for independent gasoline and their use of a price formula based on the all-rail rate, regardless of the type of transportation, have been very effective in eliminating the jobbers.

Although most of the majors have adopted the "Iowa plan" for their marketing outlets they have continued to control these stations in substantially the same way as before. This has been accomplished largely through short term cancelation clauses in leases and price concessions. The majors have acted as a group in exercising these controls over service station operators, who must now operate on a commission or gallonage basis and buy their petroleum products from the majors on a rigid tank car market. When independent competition does exist the lessee must meet this and absorb the losses or risk having his lease canceled. The gasoline price war which started in Washington, D. C., in 1939 and still continues, is a notable example of the way the service station operators must operate on a very slim margin.

SUMMARY AND CONCLUSIONS

The American petroleum industry had its origin in 1859, but its most intensive growth has accompanied the growth of the automotive industry. The total invested capital is $15,000,000,000—a growth of $9,000,000,000 since 1920. Before the 1911 decree the industry was dominated and controlled by the Standard Oil Trust. Today the petroleum industry is controlled by 20 major oil companies which have developed from some of the Standard Oil units as well as non-Standard competitors, all of them being fully integrated and acting as a group monopoly on identical policies. Certain factors tend to establish a policy of cooperation and concerted action among the major oil companies to control the industry. The American Petroleum Institute plays a very important part in bringing these policies together. In all divisions of the industry there are many jointly owned companies, especially so in the ownership of pipe lines and patents.

The major oil companies have 60 percent of the invested capital but control a much higher share of the operations and facilities of the industry. They have only about 24 percent of the oil wells, but these are by far the most productive, since they account for 52 percent of the crude oil production. The majors refine 85 percent of the crude oil and the deficiency of their own oil supply is made up by purchasing from independent operators who sell in a buyers' market, because of the major's control over the available pipe lines. The majors own or have under lease over 70 percent of all the proven oil reserves in the United States and follow a policy of developing them rather slowly, because of their ability to buy crude oil at the wells at their own uniform posted price and transport it to their refineries on a low cost basis.

The majors have been able to build their refineries at the most strategic locations, and for the most part they are very large plants capable of turning out many products at a low unit cost. They have an almost complete monopoly of the patents. The independents are handicapped by the lack of them and by the large royalties they must pay when they do use them. The independent refiners are forced to locate in or near the oil fields owing to a lack of transportation facilities. The majors purchase much of the independent's gasoline so that it will not reach independent distributors.

The majors have their strongest control in pipe lines and tankers, and in the case of pipe lines the control is very similar to that held by the Standard Oil Trust. There are no independent companies engaged solely in the transportation of oil by pipe line, except 8 companies which were units of the Standard Oil Trust. The majors own 89 percent of the crude oil trunk pipe lines, 97 percent of the gasoline pipe lines, and 87 percent of the oil tankers. Although pipe lines have been declared common carriers by statute, they have not been

so in fact, because of shipping restrictions and other controls. The operating cost of the controlled pipe line companies, compared with tariff rates charged, usually gives the major shipper-owner an advantage of 1 to 2 cents per gallon through the payment of dividends to such owners.

The majors have adopted the "Iowa plan" in marketing, whereby the stations are leased to independent operators who must buy at a rigid tank wagon price and sell in a competitive retail market on a gallonage basis. Very definite controls are maintained over these operators, so that the effect is the same as before the adoption of the plan, but social security taxes are shifted, and the effect of retail price wars does not bring about reductions in tank wagon prices. The domestic sales of gasoline by the majors is more than 80 percent of the United States total.

Therefore the independent company operating in only one division of the industry faces disadvantages of definite controls in other divisions. If he is in the marketing division, he must pay the all rail rate of some basing point formula which is nearly always twice as much as the pipe line cost; if he is in the refining business he must pay huge royalties on patents and must suffer from a lack of strategic refinery location due to a restriction of transportation facilities; the independent crude oil producer must sell in a buyer's market to major oil companies who own and control the pipe lines in the particular field.

After reading this report, one may ask how does the independent exist in view of all the controls exercised by the majors. An examination of this can be made for each of the divisions of the industry. In the producing division the independent is often the person who happens to own prospective oil lands which were obtained before probable oil production on it was a consideration. To that extent luck played an important part in these small fortunes of the independents. On the other hand, "wildcatters" gamble on their skill in discovering oil. Most of them end up in bankruptcy, but a small percentage of them do make fortunes. The independent refiners exist mainly by being able to obtain supplies of crude oil from flush fields. In the East Texas field the independent refiners were fairly successful until proration laws were passed. During the peak of their prosperity there were 74 independent refiners located in this field, but today all have closed down in the field, except 2 or 3 refineries. It is understood that the flush fields of Illinois are now affording an opportunity for the independent refiners to operate profitably. Illinois does not regulate crude oil production on the basis of market demand. The profitableness of the truly independent jobber depends mainly on his ability to do business with the independent refiner. The service station operators exist mainly by working longer hours and paying lower wages than the majors now pay at the few company-operated stations, and did pay before they adopted the Iowa plan. Generally speaking, it can be said that many independent producers and refiners sell their crude oil and gasoline to the majors and make enough to continue in business.

In many respects the characteristics of the petroleum industry resemble those of a public utility, and because of the public interest involved in the problems of the consumer and national defense, it is conceivable that the continuance of present practices and conditions may lead to regulation of the industry by the State and Federal Governments on public utility principles.

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APPENDIX

The tables and charts contained in this appendix have been reproduced entirely from the records of the hearings before the Temporary National Economic Committee on the Petroleum Industry, September 25 to October 25, 1939.

TABLE 1.—*Comparison of gasoline consumption, domestic crude oil production, and motor vehicle registrations, by years, 1900–38*

Year	Gasoline consumption [1]	Motor vehicle registration	Domestic production of crude oil [1]	Year	Gasoline consumption [1]	Auto registrations	Domestic production of crude oil [1]
1938	521, 657	29, 458, 680	1, 213, 000	1918	79, 949	6, 146, 617	335, 928
1937	518, 760	29, 795, 200	1, 279, 000	1917	(2)	4. 983. 000	335, 316
1936	481, 606	28, 165, 550	1, 098, 516	1916		3, 513, 000	300, 767
1935	434, 810	26, 230, 834	996, 596	1915		2, 446, 000	281, 104
1934	410, 339	24, 951, 662	908, 065	1914		1, 711, 000	265, 763
1933	380, 494	25, 843, 591	905, 656	1913		1, 258, 000	248, 446
1932	377, 791	24, 115, 129	785, 159	1912		944, 000	222, 935
1931	407, 843	25, 832, 884	851, 081	1911		640, 000	220, 449
1930	397, 609	26, 545, 281	898, 011	1910		469, 000	209, 557
1929	382, 878	26, 501, 443	1, 007, 323	1909		312, 000	183, 171
1928	338, 881	24, 493, 124	901, 474	1908		198, 000	178, 527
1927	305, 367	23, 133, 243	901, 129	1907		142, 000	166, 095
1926	268, 128	22, 001, 393	770, 874	1906		107, 000	126, 494
1925	232, 745	19, 937, 274	763, 743	1905		78, 000	134, 717
1924	196, 586	17, 595, 373	713, 940	1904		55, 000	117, 081
1923	175, 088	15, 092, 177	732, 407	1903		32, 920	100, 461
1922	137, 770	12, 238, 375	557, 531	1902		23, 000	88, 767
1921	116, 840	10, 463, 295	472, 183	1901		14, 000	69, 389
1920	108, 948	9, 231, 941	442, 929	1900		8, 000	63, 621
1919	88, 648	7, 565, 446	378, 367				

[1] Unit is thousands of barrels.
[2] Authoritative figures prior to 1913 are not available.

Source: American Petroleum Institute, Bureau of Public Roads, Department of Agriculture.

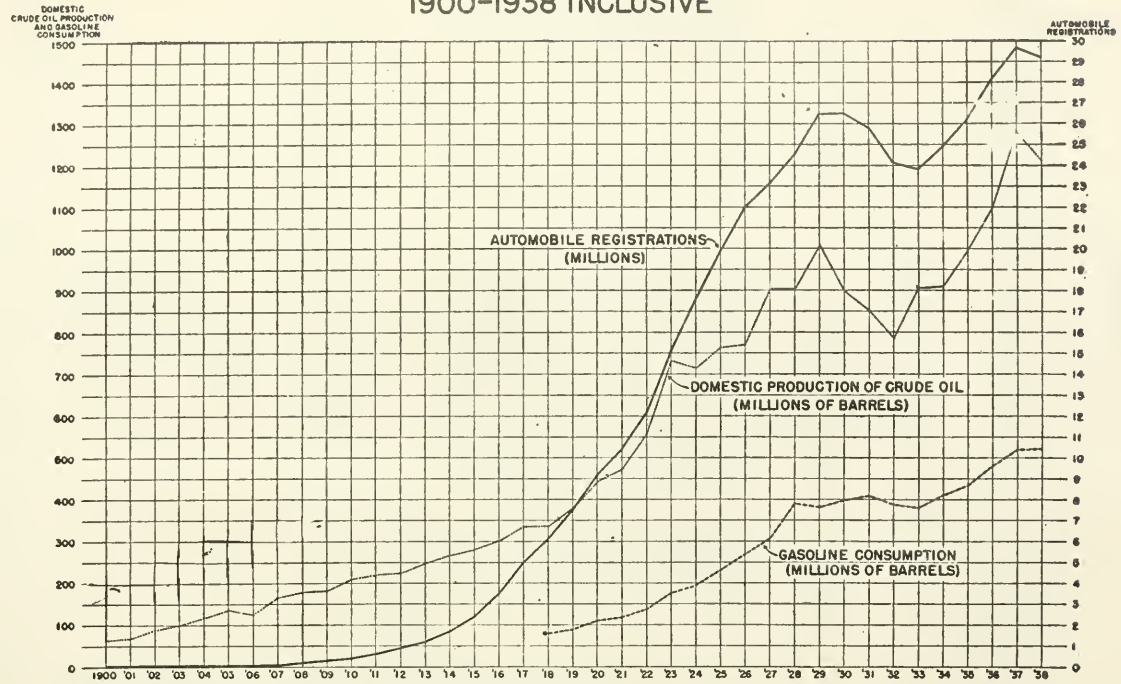
TABLE 2.—*Trend of gross investment in properties, plant and equipment of the American Petroleum Industry,[1] by years, 1921–38*

Year	Million dollars	Year	Million dollars
1921	6, 550	1930	12, 000
1922	7, 877	1931	12, 100
1923	8, 000	1932	12, 200
1924	9, 151	1933	12, 300
1925	9, 500	1934	12, 700
1926	10, 000	1935	13, 276
1927	10, 500	1936	13, 775
1928	11, 000	1937	14, 525
1929	11. 500	1938	14, 750

[1] Petroleum Facts and Figures (1937), p. 170 for figures 1921–1936, and Fred Van Covern, Director of Department of Statistics of Petroleum Institute for figures 1937, 1938.

CHART I

COMPARISON OF GASOLINE CONSUMPTION, DOMESTIC CRUDE OIL PRODUCTION AND AUTOMOBILE REGISTRATIONS 1900–1938 INCLUSIVE

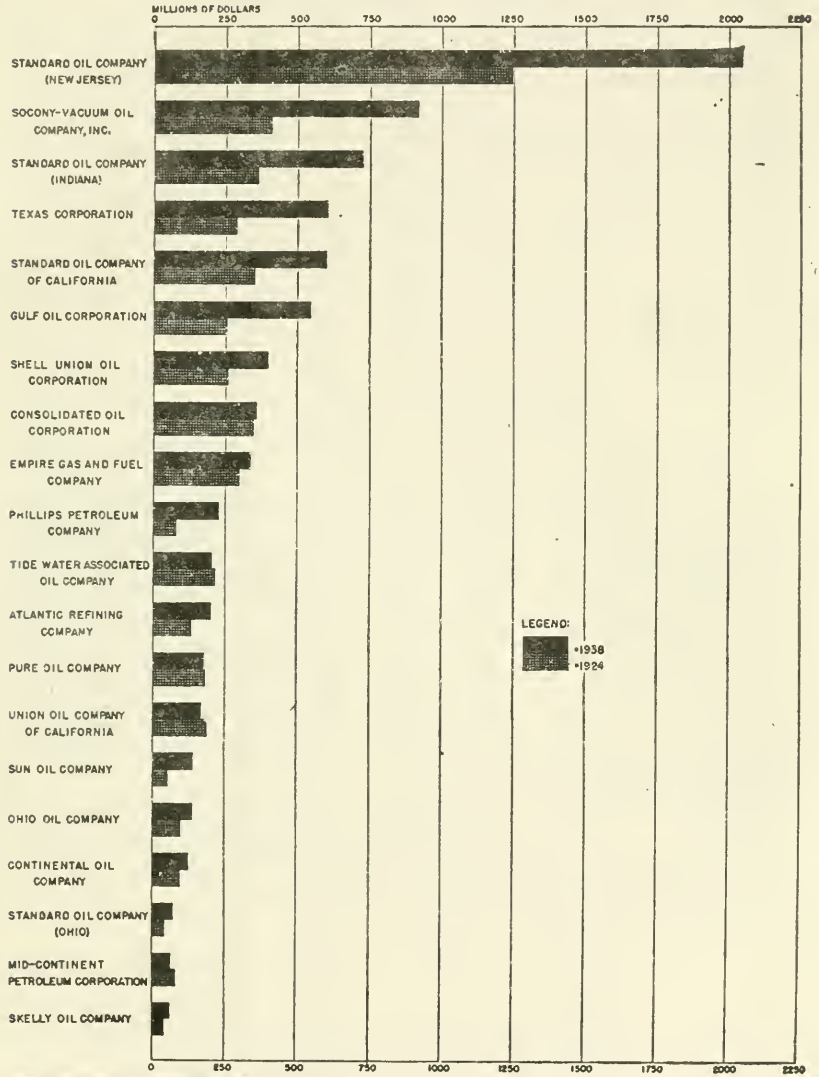


SOURCE: AMERICAN PETROLEUM INSTITUTE, BUREAU OF PUBLIC ROADS, DEPARTMENT OF AGRICULTURE

*AUTHORITATIVE FIGURES PRIOR TO 1918 NOT AVAILABLE

CHART II

COMPARISON OF THE TOTAL ASSETS OF TWENTY MAJOR OIL COMPANIES FOR THE YEARS 1924 AND 1938



SOURCE: ANNUAL REPORTS TO STOCKHOLDERS AND MOODY'S INDUSTRIALS

TABLE 3.—*Total assets of 20 major oil companies, 1924–38*

[In millions of dollars]

Name of company	1924	1925	1926	1927	1928	1929	1930	1931
1. Standard Oil Co. (New Jersey)	$1,244.9	$1,369.2	$1,541.9	$1,426.6	$1,572.3	$1,767.4	$1,771.0	$1,919.0
2. Socony-Vacuum Oil Co., Inc	406.2	533.0	691.2	678.1	695.4	708.4	720.3	1,038.6
3. Standard Oil Co. (Indiana)	361.5	406.1	446.5	462.6	498.4	697.0	810.2	762.7
4. The Texas Corporation	288.3	298.6	328.8	324.8	461.8	609.9	581.9	543.3
5. Standard Oil Co. of California	352.8	373.7	573.8	579.3	590.0	604.7	610.3	590.7
6. Gulf Oil Corporation	252.0	279.0	322.5	347.2	381.7	430.8	488.7	452.7
7. Shell Union Oil Corporation	257.0	267.2	289.7	348.1	356.9	486.5	471.9	427.0
8. Consolidated Oil Corporation	346.2	251.9	364.8	367.9	402.0	400.6	404.9	376.4
9. Empire Gas & Fuel Co	301.4	287.9	298.3	265.3	282.8	327.1	403.3	403.5
10. Phillips Petroleum Co	78.7	96.3	121.1	143.5	129.3	145.4	214.4	201.4
11. Tide Water Associated Oil Co	211.4	236.3	242.7	248.9	249.4	251.4	248.3	228.8
12. The Atlantic Refining Co	131.0	134.0	140.3	138.9	155.7	166.2	159.1	159.4
13. The Pure Oil Co	181.6	182.0	178.3	186.3	188.8	195.5	215.4	216.6
14. Union Oil Co. of California	184.2	182.0	194.8	190.0	195.0	211.2	222.7	202.2
15. Sun Oil Co	51.5	55.1	58.7	65.7	74.5	85.3	94.1	95.4
16. The Ohio Oil Co	97.7	99.9	107.7	104.5	104.2	110.7	215.1	176.8
17. Continental Oil Co	93.9	92.8	102.5	116.4	104.9	198.0	178.0	151.8
18. Standard Oil Co. (Ohio)	42.9	45.1	45.5	42.3	45.8	48.7	54.9	64.4
19. Mid-Continent Petroleum Corporation	79.7	77.8	84.1	84.2	81.5	85.9	81.9	74.9
20. Skelly Oil Co	39.9	39.9	46.1	53.5	58.1	62.8	69.1	50.1
Total	5,002.5	5,407.8	6,179.1	6,174.1	6,628.4	7,593.6	8,006.6	8,135.7

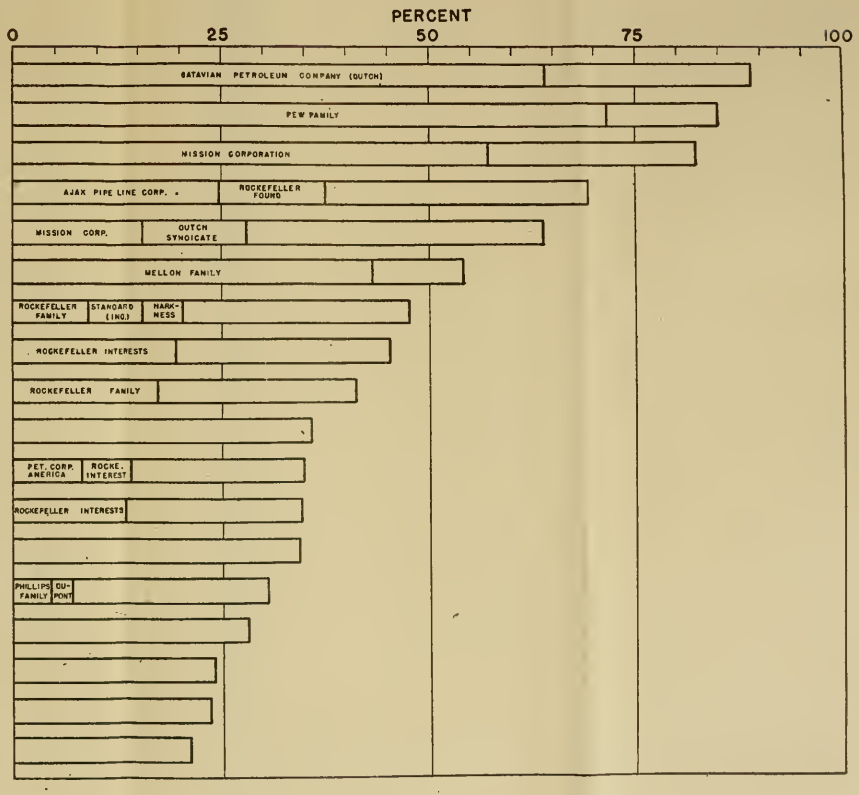
Name of company	1932	1933	1934	1935	1936	1937	1938
1. Standard Oil Co. (New Jersey)	$1,888.0	$1,912.2	$1,941.7	$1,894.9	$1,841.8	$2,060.8	$2,044.6
2. Socony-Vacuum Oil Co., Inc	1,000.5	983.3	783.8	784.9	801.7	900.4	919.1
3. Standard Oil Co. (Indiana)	693.2	676.8	660.7	693.5	710.4	735.1	724.7
4. The Texas Corporation	513.8	484.5	474.8	473.8	540.1	614.8	605.4
5. Standard Oil Co. of California	578.0	567.8	565.4	575.8	582.4	592.3	601.1
6. Gulf Oil Corporation	435.9	427.8	422.0	430.2	442.0	560.4	546.9
7. Shell Union Oil Corporation	393.0	375.0	347.9	357.6	370.6	377.3	397.5
8. Consolidated Oil Corporation	368.0	358.3	331.3	328.2	339.2	348.6	357.1
9. Empire Gas & Fuel Co	405.2	400.5	393.8	398.9	410.8	427.5	337.1
10. Phillips Petroleum Co	178.4	170.9	169.5	174.5	187.5	212.5	226.7
11. Tide Water Associated Oil Co	192.0	188.1	179.4	182.8	190.8	203.8	202.8
12. The Atlantic Refining Co	156.6	160.1	164.2	163.0	166.0	186.2	199.1
13. The Pure Oil Co	144.6	143.4	144.6	157.2	162.8	178.4	180.4
14. Union Oil Co. of California	197.7	189.6	150.7	151.7	153.2	165.5	166.0
15. Sun Oil Co	96.7	101.1	103.0	107.1	117.4	128.4	139.1
16. The Ohio Oil Co	177.3	171.5	169.2	139.7	138.5	138.9	138.7
17. Continental Oil Co	87.5	90.3	85.9	91.7	96.6	104.4	125.1
18. Standard Oil Co. (Ohio)	60.4	58.8	55.1	56.9	61.0	63.8	70.5
19. Mid-Continent Petroleum Corporation	73.2	71.4	58.7	60.6	63.0	65.4	63.7
20. Skelly Oil Co	45.2	43.0	43.3	46.1	51.2	56.5	62.0
Total	7,685.0	7,574.2	7,245.1	7,269.2	7,427.2	8,120.9	8,107.5

Source: Annual reports to stockholders and Moody's Industrials.

CHART III

COMMON STOCK HELD BY THE 100 LARGEST STOCKHOLDERS OF THE MAJOR OIL COMPANIES. DECEMBER 31, 1938

NAME OF COMPANY	TOTAL NUMBER OF COMMON STOCKHOLDERS
SHELL UNION OIL CORP.	17,393
SUN OIL CO.	5,226
SKELLY OIL CO.	3,152
STANDARD OIL CO. (OHIO)	3,532
TIDE WATER ASSOCIATION OIL CO.	24,116
GULF OIL CO. OF PA.	15,135
STANDARD OIL CO. (N.J)	126,383
OHIO OIL CO.	31,287
SOCONY VACUUM OIL CORP.	113,240
CONTINENTAL OIL CO.	29,969
CONSOLIDATED OIL CORP.	89,068
STANDARD OIL CO. (INDIANA)	99,665
PURE OIL CO.	29,033
PHILLIPS PETROLEUM CO.	40,105
*UNION OIL CO. OF CALIF.	26,524
THE TEXAS CORPORATION	86,380
ATLANTIC REFINING CO.	29,313
CITIES SERVICE CO.	466,658



* STEWART FAMILY OWNS LARGE PORTION OF STOCK

SOURCE - TEMPORARY NATIONAL ECONOMIC COMMITTEE QUESTIONAIRE FOR OIL COMPANIES

TABLE 4.—*Composite analysis of earnings, dividends, and changes in surplus of 20 major oil companies*

Year ended—	Book value of common stock			Net earnings applicable to common stock			Dividends paid to common stock			Net increase or decrease of surplus		
	Par or stated value	Surplus	Total	Amount	Percent	Percent	Amount	Percent	Percent	Amount	Percent	Percent
Dec. 31:												
1938	$3,312,161,751	$2,213,490,479	$5,527,652,230	$271,121,583	8.2	4.9	$184,954,852	5.6	3.3	−$43,365,975	−1.3	−0.8
1937	3,303,097,026	2,256,856,454	5,559,953,480	545,356,948	16.5	9.8	269,687,101	8.2	4.9	+270,471,327	+8.2	+4.9
1936	3,238,887,025	1,986,385,127	5,225,272,152	380,890,578	11.8	7.3	318,370,074	9.8	6.1	+39,350,247	+1.2	+.8
1935	3,095,222,639	1,947,034,880	5,042,257,519	242,264,649	7.8	4.8	127,835,021	4.1	2.5	+119,803,740	+3.9	+2.4
1934	3,138,877,492	1,827,231,140	4,966,108,632	142,321,656	4.5	2.9	118,695,549	3.8	2.4	+99,299		
1933	3,494,162,105	1,827,131,841	5,321,293,946	73,696,341	2.1	1.4	97,663,719	2.8	1.8	−52,201,313	−1.5	−1.0
1932	3,508,265,006	1,879,333,154	5,387,598,160	43,539,892	1.2	.8	140,003,270	4.0	2.6	−148,054,473	−4.2	−2.7
1931	3,728,140,970	2,027,387,627	5,755,528,597	[1] 77,210,476	[1] 2.1	[1] 1.3	207,692,084	5.6	3.6	−64,419,614	−1.7	−1.1
1930	3,560,727,395	2,091,807,241	5,652,534,636	254,075,710	7.1	4.5	273,555,746	7.7	4.8	−10,219,531	−.3	−.2
1929	3,412,188,155	2,102,026,772	5,514,214,927	527,506,438	15.5	9.6	395,126,322	11.6	7.2	+263,850,318	+7.7	+4.8
1928	3,028,065,476	1,838,176,454	4,866,241,930	450,426,284	14.9	9.3	214,565,440	7.1	4.4	+246,753,461	+8.1	+5.1
1927	2,936,075,727	1,591,422,993	4,527,498,720	204,963,436	7.0	4.5	213,918,317	7.3	4.7	−140,233,748	−4.8	−3.1
1926	2,881,453,427	1,731,656,741	4,613,110,168	482,177,591	16.7	10.5	200,903,507	7.0	4.4	+299,473,786	+10.4	+6.5
1925	2,640,460,945	1,432,182,955	4,072,643,900	432,189,385	16.4	10.6	132,713,548	5.0	3.3	+322,258,406	+12.2	+7.9
1924	2,522,919,697	1,109,924,549	3,632,844,246	276,042,593	10.9	7.6	122,413,436	4.9	3.4	+130,144,163	+5.2	+3.6
Average	3,186,713,656	1,857,469,894	5,044,183,550	283,290,841	8.9	5.6	201,206,532	6.3	4.0	+82,245,340	+2.6	+1.6

[1] Deficit.

TABLE 5.—*Shares of common stock held by the 100 largest stockholders of the major oil companies,*[1] *Dec. 31, 1938*

Name of company	Total number of common stockholders	Total, common shares outstanding	Shares held by 100 largest stockholders	Percentage
Shell Union Oil Corporation	17,393	13,070,625	11,624,611	88.9
Sun Oil Co	5,226	2,316,484	1,966,808	84.9
Skelly Oil Co	3,152	995,349	817,245	82.1
Standard Oil Co. (Ohio)	3,532	753,740	521,166	69.1
Tide Water Associated Oil Co	24,116	6,375,253	4,066,873	63.7
Gulf Oil Corporation of Pennsylvania	15,135	13,751,846	7,430,934	54.0
Standard Oil Co. (New Jersey)	126,383	26,618,065	12,582,063	47.3
Ohio Oil Co	31,287	6,563,377	2,955,244	45.0
Socony-Vacuum Oil Co	113,240	31,206,071	12,803,585	41.0
Continental Oil Co	29,969	4,738,593	1,688,030	35.6
Consolidated Oil Corporation	89,068	13,751,846	4,801,289	34.9
Standard Oil Co. (Indiana)	99,665	15,272,020	5,267,862	34.5
Pure Oil Co	29,033	3,982,031	1,359,856	34.1
Phillips Petroleum Co	40,105	4,449,052	1,355,054	30.4
Union Oil Co. of California	26,524	4,666,270	(2)	[2] 28.1
Texas Corporation	86,380	10,876,882	2,605,090	24.0
Atlantic Refining Co	29,313	2,663,999	633,271	23.8
Cities Service Co	466,658	3,704,067	776,599	21.0

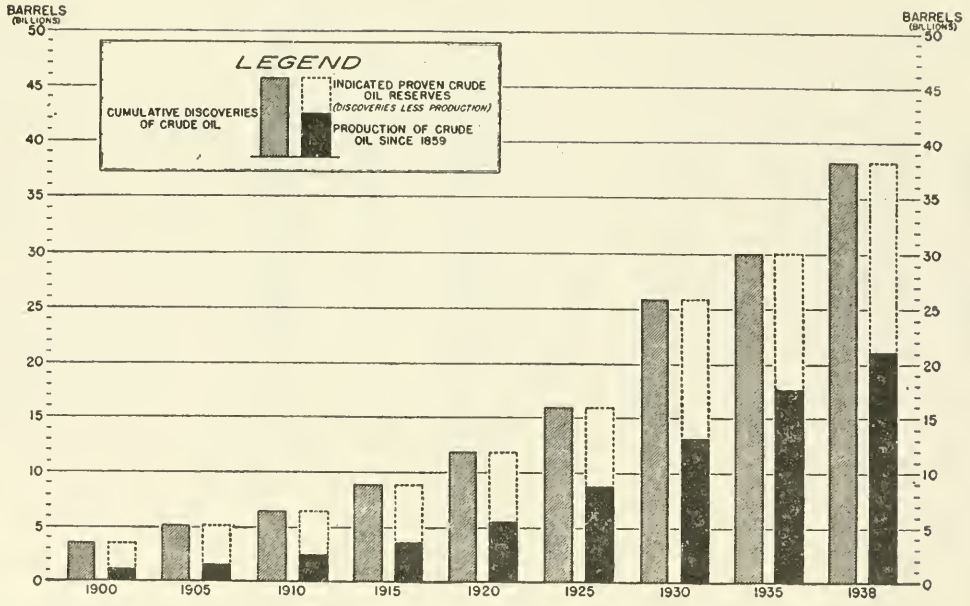
[1] Source: Temporary National Economic Committee questionnaire. Standard Oil Co. of California and Mid-Continent Petroleum Corporation did not answer.

[2] Figure not available, as company reported percentage only.

CHART IV

COMPARISON OF CRUDE OIL PRODUCTION SINCE 1859 WITH CUMULATED DISCOVERIES OF CRUDE OIL, INDICATING PROVEN CRUDE OIL RESERVES

UNITED STATES, 1900–1938



SOURCE: U. S. BUREAU OF MINES (PUBLISHED BY STANDARD STATISTICS, INC.)

TABLE 6.—*Total acreage of oil lands held in the United States by major oil companies, by years, 1929–38*

Name of company	Dec. 31, 1938		Dec. 31, 1937		Dec. 31, 1936		Dec. 31, 1935		Dec. 31, 1934	
	Total acreage	Percentage leased	Total acreage	Percentage leased	Total acreage	Percentage leased	Total acreage	Percentage leased	Total acreage	Percentage leased
Total	56,438,254	93.9	58,713,205	94.4	52,511,088	93.8	46,254,828	92.2	41,509,588	92.7
Atlantic Refining Co	1,086,734	91.4	1,060,399	91.2	1,040,023	91.2	1,007,708	91.1	974,753	90.8
Cities Service Co	2,213,947	97.1	2,409,728	97.3	2,447,806	97.3	2,523,703	97.3	2,127,124	96.9
Consolidated Oil Corporation	1,733,404	(1)	1,780,818	(1)	1,704,610	(1)	1,637,672	(1)	1,788,493	(1)
Continental Oil Co	1,687,123	92.8	1,634,142	93.2	1,527,395	92.7	1,648,257	93.7	1,738,295	94.1
Gulf Oil Corporation of Pennsylvania	7,407,286	99.2	8,652,957	99.3	6,330,731	99.1	5,122,979	98.8	4,853,488	98.8
Mid-Continent Petroleum Corporation [2]	822,289	(1)	886,951	(1)	770,350	(1)	674,575	(1)	612,763	(1)
Ohio Oil Co	1,668,378	98.3	1,608,191	98.1	1,385,425	97.9	1,113,669	97.3	1,058,040	97.2
Phillips Petroleum Co	1,573,405	99.7	1,794,227	99.8	1,356,237	99.7	1,219,258	99.7	1,001,994	99.8
Pure Oil Co	1,147,261	98.9	1,171,315	98.8	1,161,032	98.7	807,253	98.2	829,405	98.2
Shell Union Oil Corporation	2,342,675	96.9	2,905,475	99.8	3,059,934	97.6	3,138,131	98.5	2,154,048	97.0
Skelly Oil Co	730,570	97.9	716,464	97.8	635,223	98.0	638,208	98.1	638,503	98.1
Socony-Vacuum Oil Co	5,696,235	89.3	5,654,733	90.6	5,038,026	89.5	4,436,834	82.0	4,154,748	80.6
Standard Oil Co., of Calif. [2]	1,814,936	78.5	1,663,401	76.9	1,458,294	67.0	1,137,126	67.4	427,832	94.6
Standard Oil Co. (Indiana)	1,962,255	89.3	1,938,807	89.1	1,813,082	88.3	1,575,626	85.2	1,420,068	99.8
Standard Oil Co. (New Jersey)	10,552,258	95.2	9,565,714	95.0	8,758,904	94.8	8,290,592	93.1	7,845,885	93.0
Standard Oil Co. (Ohio)	55,319	100.0	13,761	100.0						
Sun Oil Co	4,523,451	99.6	4,669,806	99.6	4,297,069	99.6	3,839,029	99.6	3,468,842	99.7
Texas Corporation	8,016,785	89.9	9,392,131	91.6	8,816,545	91.2	6,599,436	88.3	5,670,696	85.5
Tide Water Associated Oil Co	1,103,175	93.8	874,170	92.3	644,832	89.5	580,011	88.6	494,278	86.8
Union Oil Co. of California	300,768	41.3	320,015	38.8	265,570	27.2	264,761	27.6	250,333	23.7

Name of company	Dec. 31, 1933		Dec. 31, 1932		Dec. 31, 1931		Dec. 31, 1930		Dec. 31, 1929	
	Total acreage	Percentage leased	Total acreage	Percentage leased	Total acreage	Percentage leased	Total acreage	Percentage leased	Total acreage	Percentage leased
Total	35,815,703	91.9	36,463,750	91.9	39,695,473	92.7	49,902,393	94.3	43,422,514	94.8
Atlantic Refining Co	985,595	90.1	1,142,971	92.2	1,311,865	93.2	1,471,067	93.9	1,019,192	94.0
Cities Service Co	1,971,950	96.6	2,382,025	97.1	3,224,170	97.9	3,604,462	98.1	2,433,931	97.6
Consolidated Oil Corporation	1,722,657	(1)	2,693,585	(1)	1,076,718	(1)	1,574,110	(1)	1,353,773	(1)
Continental Oil Co	1,543,905	93.5	1,658,481	94.5	1,811,567	97.5	2,227,565	99.1	2,149,636	99.5
Gulf Oil Corporation of Pennsylvania	4,237,229	98.8	3,610,946	98.6	4,289,673	98.9	5,577,722	99.1	5,272,445	99.1
Mid-Continent Petroleum Corporation [2]	612,763	(1)	718,458	(1)	717,385	(1)	783,826	(1)	(1)	(1)
Ohio Oil Co	1,267,568	97.4	1,352,661	97.7	1,355,556	97.7	2,126,680	98.5	1,709,876	98.7
Phillips Petroleum Co	934,460	99.8	995,629	99.7	1,286,340	99.8	2,358,658	99.9	1,506,246	99.9
Pure Oil Co	1,002,496	98.6	1,346,603	98.9	2,197,635	99.4	3,112,670	99.6	3,824,397	99.7
Shell Union Oil Corporation	1,683,359	96.1	1,726,035	96.3	1,850,783	97.0	3,018,089	98.1	2,914,822	98.1
Skelly Oil Co	595,910	(1)	891,417	(1)	970,985	(1)	1,180,807	(1)	1,001,472	(1)
Socony-Vacuum Oil Co	3,891,138	79.2	3,956,852	79.8	4,501,079	82.4	4,661,518	80.3	4,246,101	80.2
Standard Oil Co. of California [2]	400,361	94.8	940,279	68.0	1,020,115	70.6	1,194,354	71.9		
Standard Oil Co. (Indiana)	1,317,753	99.8	1,451,734	99.8	1,706,646	99.9	1,864,974	99.9	1,967,071	99.9
Standard Oil Co. (New Jersey)	5,595,837	91.0	4,278,146	94.8	4,490,449	97.3	5,700,775	98.0	4,969,064	97.8
Standard Oil Co. (Ohio)										
Sun Oil Co	2,456,270	99.6	1,690,002	99.5	1,836,388	99.6	2,346,151	99.7	2,366,892	99.7
Texas Corporation	4,960,620	87.1	4,939,601	87.8	5,276,979	88.0	6,124,560	89.1	5,631,424	88.4
Tide Water Associated Oil Co	386,550	83.1	445,151	85.3	525,673	87.5	721,596	90.7	800,723	90.0
Union Oil Co. of California	249,282	23.5	243,174	21.5	245,467	20.8	252,809	23.3	255,449	23.8

[1] Break-down not reported for acreage leased.

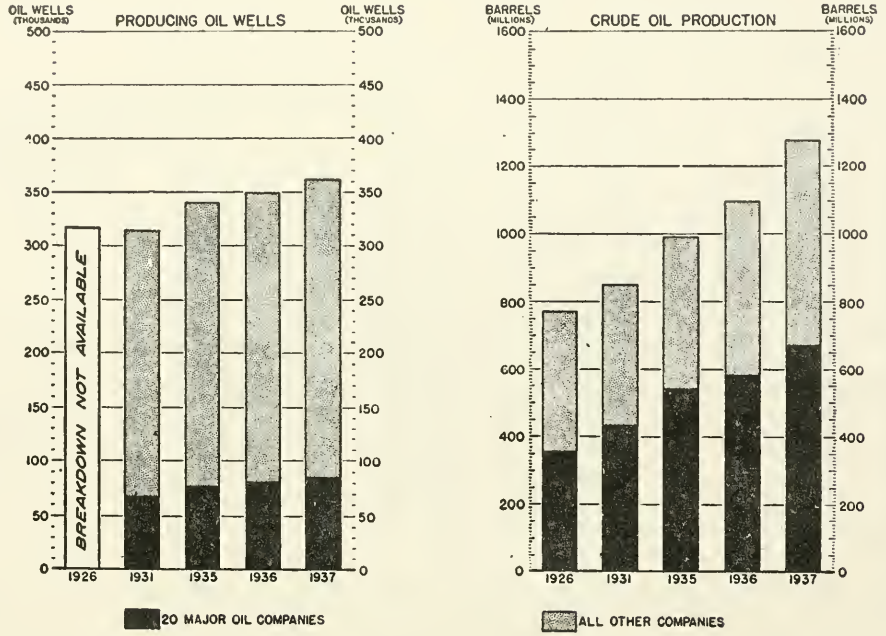
[2] The Standard Oil Co. of California and the Mid-Continent Petroleum Corporation did not answer the questionnaire; acreage statistics are as given in Moody's Manual of Investments.

Source: Temporary National Economic Committee Questionnaire for Oil Companies.

CHART V

NUMBER OF OIL WELLS AND CRUDE OIL PRODUCTION FOR THE UNITED STATES

BY YEARS, 1926, 1931, 1935-'37



SOURCE U S BUREAU OF MINES

TABLE 7.—*Domestic production of crude petroleum and producing oil wells* [1] *20 major oil companies and all companies*

Year	Domestic production of crude petroleum (in thousands of 42-gallon barrels)			Producing oil wells		
	All companies	20 major oil companies		All companies	20 major oil companies	
		Number	Percent of total		Number	Percent of total
1926	770,874	357,137	46.3	318,600	(2)	
1931	851,081	434,980	51.1	315,850	68,562	21.7
1935	996,596	542,786	54.5	340,990	77,275	22.7
1936	1,099,687	585,618	53.3	349,450	81,716	23.4
1937	1,279,160	671,992	52.5	363,030	86,125	23.7

[1] Source: U. S. Bureau of Mines.
[2] Not available.

TABLE 8.—*Number of domestic producing oil wells owned or operated by major oil companies, by years, 1929–38*

Name of company	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Total	95,034	90,507	83,922	78,226	75,767	76,311	76,957	71,557	77,757	76,813
Atlantic Refining Co	2,029	1,739	1,396	1,154	951	717	600	339	392	427
Cities Service Co	7,013	6,924	6,527	6,120	6,055	5,988	6,014	6,101	6,483	5,067
Consolidated Oil Corporation	9,434	9,280	9,161	8,525	8,364	7,899	8,270	2,106	2,332	2,278
Continental Oil Corporation	2,850	2,681	2,444	2,276	2,365	2,385	2,478	2,616	2,707	2,511
Gulf Oil Corporation of Pennsylvania [1]	6,871	6,440	5,677	5,238	4,841	4,593	4,672	4,375	4,750	4,814
Ohio Oil Co	11,247	11,174	11,112	11,060	11,287	15,294	15,341	15,609	16,578	17,085
Phillips Petroleum Co	4,614	4,460	4,348	3,162	3,282	3,296	3,386	3,623	3,725	2,873
Pure Oil Co	4,969	4,832	4,656	4,595	4,642	4,657	4,811	4,891	4,921	4,997
Shell Union Oil Corporation	5,356	4,496	4,108	3,671	3,457	3,281	3,236	3,123	3,492	3,526
Skelly Oil Co	1,802	1,803	1,640	1,412	1,228	1,122	1,113	1,149	1,228	1,300
Socony-Vacuum Oil Co	8,497	8,076	7,624	7,225	6,991	6,291	6,849	7,175	7,383	7,585
Standard Oil Co. (Indiana)	3,818	3,400	2,584	2,147	1,428	1,222	1,136	1,088	1,109	829
Standard Oil Co. (New Jersey)	10,181	9,508	8,595	8,262	8,204	7,494	7,172	6,801	7,351	7,478
Standard Oil Co. (Ohio) [1]	354	314								
Sun Oil Co. [1]	1,983	1,863	1,616	1,441	1,301	1,109	986	807	800	819
Texas Corporation	8,853	8,354	7,846	7,265	7,138	6,991	7,062	7,048	7,608	7,948
Tide Water Associated Oil Co	3,891	3,915	3,421	3,584	3,233	3,019	2,878	3,749	5,937	6,335
Union Oil Co. of California	1,272	1,248	1,167	1,089	1,000	953	953	957	961	941

[1] Segregation of oil and gas wells not made. Gas wells usually represent a small part of total wells.

Source: Temporary National Economic Committee Questionnaire for Oil Companies. Standard Oil Co. of California and Mid-Continent Petroleum Corporation did not answer the Committee's questionnaire.

TABLE 9.—*Gross production of crude oil by major oil companies, by years, 1929–38*

[In 42-gallon barrels]

Name of company	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Total	528,436,873	576,396,830	498,185,292	456,463,348	412,231,330	404,176,279	361,576,827	377,376,015	414,948,498	452,731,867
Atlantic Refining Co	15,416,569	15,479,903	13,098,066	12,458,183	11,971,107	9,298,900	4,989,354	2,845,068	3,503,477	5,946,695
Cities Service Co	25,728,439	27,998,145	25,983,160	28,755,351	29,139,155	28,502,460	23,102,159	29,403,749	32,038,813	22,294,117
Consolidated Oil Co	28,111,000	34,756,000	30,124,000	27,081,000	29,312,000	29,956,000	27,306,000	16,981,000	16,800,000	18,301,000
Continental Oil Co	27,336,667	29,245,394	23,282,458	17,813,148	16,804,658	17,366,432	18,252,120	20,321,593	24,938,379	25,488,800
Gulf Oil Corporation of Pennsylvania [1]	40,803,603	46,317,469	41,759,645	37,381,884	35,640,495	37,494,191	35,123,056	37,955,483	42,746,640	50,058,588
Ohio Oil Co	23,516,689	27,279,880	23,023,935	22,180,701	21,636,709	24,193,984	24,703,556	27,557,998	32,248,393	32,280,483
Phillips Petroleum Co	24,933,040	29,101,433	23,780,737	25,416,390	22,249,898	23,786,738	15,384,116	19,093,927	13,714,590	14,391,951
Pure Oil Co. [1]	19,683,537	20,308,075	20,407,677	22,930,295	18,538,227	19,460,035	19,819,442	17,800,029	15,356,183	16,669,626
Shell Union Oil Corporation	53,236,219	54,837,890	52,441,082	48,510,581	39,292,193	38,164,329	34,266,459	35,744,173	42,388,774	57,980,157
Skelly Oil Co	9,267,799	12,757,490	9,625,393	7,473,337	7,138,563	6,101,478	5,010,087	6,362,287	7,280,047	9,793,943
Socony-Vacuum Oil Co	58,481,140	61,673,380	48,427,540	44,564,151	40,654,802	38,399,225	36,837,037	38,105,206	44,188,663	57,802,563
Standard Oil Co. (Indiana)	37,400,514	39,789,078	33,118,839	25,337,474	19,134,592	16,412,764	14,748,467	17,137,958	18,791,711	7,276,163
Standard Oil Co. (New Jersey) [1]	60,619,948	67,997,777	56,900,800	50,816,098	48,147,476	44,186,098	35,750,167	40,463,852	42,365,978	42,076,634
Standard Oil Co. (Ohio) [2]	360,986	164,265								
Sun Oil Co	14,549,872	14,634,082	12,511,565	11,285,099	10,621,058	9,678,296	7,894,561	8,413,497	8,387,190	7,560,172
Texas Corporation [1]	48,159,992	49,525,343	43,984,432	37,646,139	31,086,158	30,854,254	28,968,275	28,863,240	36,603,829	43,599,124
Tide Water Associated Oil Co. [1]	21,597,468	23,344,530	20,560,789	19,117,840	16,876,544	16,964,040	14,717,996	16,886,549	17,292,587	20,587,893
Union Oil Co. of California	19,233,391	21,186,696	19,155,174	17,695,677	13,987,695	13,357,055	14,703,975	13,450,406	16,303,244	20,623,928

[1] Net crude oil production.
[2] Unspecified crude oil production.

Source: Temporary National Economic Committee Questionnaire for Oil Companies. Standard Oil of California and Mid-Continent Petroleum Corporation did not answer the committee's questionnaire.

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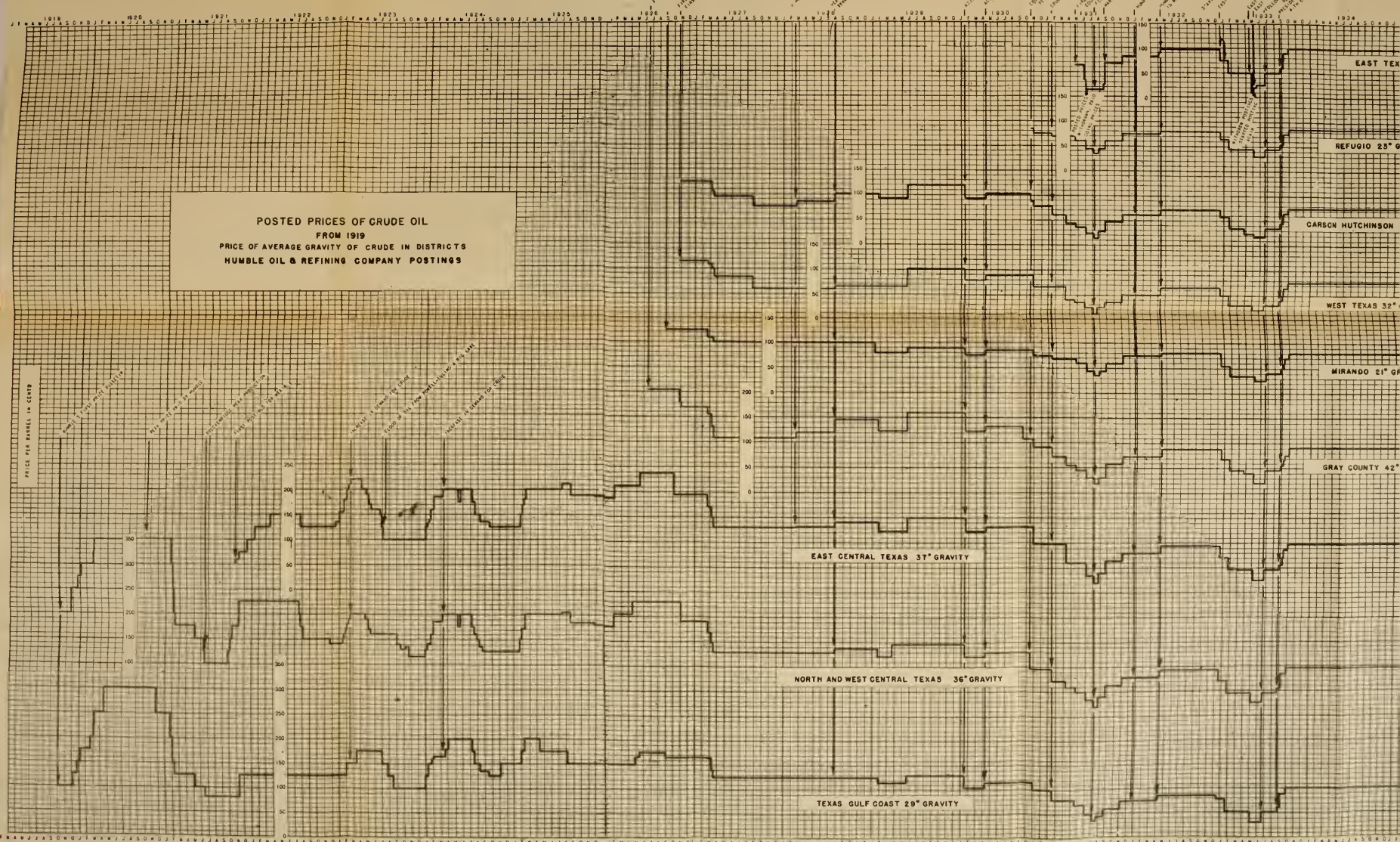
TABLE 10.—*Purchases of crude oil by major oil companies (excluding imports) by years, 1929–38*

[In 42-gallon barrels]

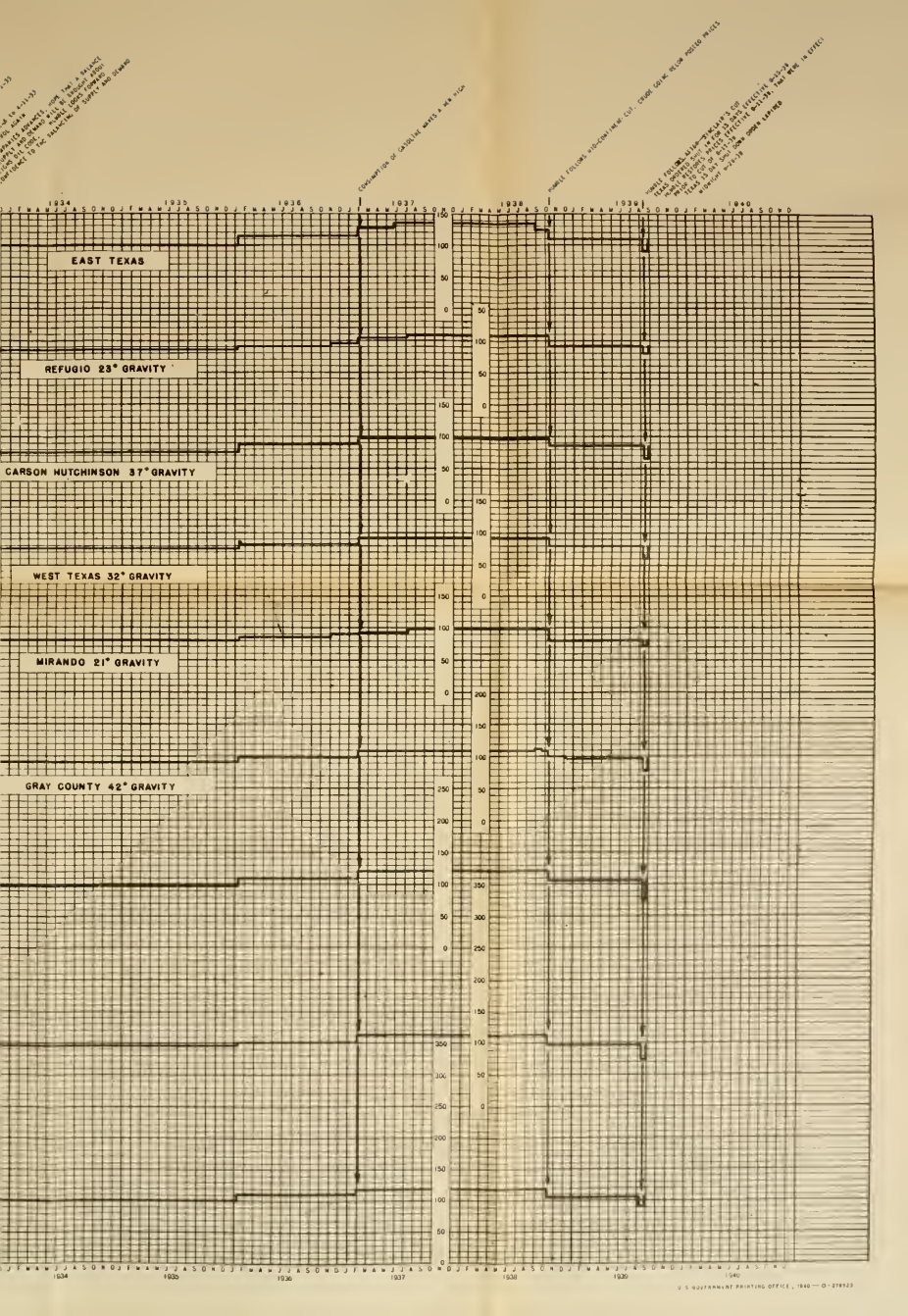
Name of company	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Total	651, 828, 473	704, 259, 062	590, 944, 083	520, 913, 523	472, 240, 031	485, 365, 622	486, 589, 956	467, 104, 220	479, 640, 698	490, 405. 352
Atlantic Refining Co	30, 246, 856	34, 443, 533	28, 348, 538	25, 706, 687	22, 696, 876	21, 080, 050	22, 035, 393	32, 082, 191	22, 168, 212	24, 465, 601
Cities Service Co	20, 711, 380	23, 733, 550	20, 033, 866	22, 709, 671	20, 013, 394	23, 770, 420	17, 249, 454	20, 850, 530	12, 513, 456	11, 890, 509
Consolidated Oil Corporation	38, 077, 017	43, 487, 850	35, 327, 403	31, 306, 317	28, 474, 360	33, 102, 929	72, 849, 286	31, 366, 487	35, 931, 591	34, 560, 750
Continental Oil Co	15, 777, 504	16, 017, 410	13, 994, 779	16, 086, 003	16, 233, 255	19, 198, 424	16, 388, 068	19, 034, 955	17, 202, 106	
Gulf Oil Corporation of Pennsylvania	42, 217, 337	43, 587, 416	33, 439, 081	24, 280, 503	17, 433, 315	18, 928, 879	16, 384, 010	13, 873, 619	16. 913, 204	18, 523, 811
Ohio Oil Co	8, 006, 603	8, 327, 028	6, 433, 562	6, 133, 227	5, 523, 174	5, 462, 328	8, 396, 707	6, 763, 191	8, 144, 047	8, 204. 618
Phillips Petroleum Co	18, 368, 641	23, 326, 811	15, 830, 149	14, 883, 487	10, 906, 094	11, 689, 381	9, 167, 718	7, 275, 517	3, 733, 439	2, 238. 984
Pure Oil Co	22, 534, 742	28, 497, 217	23, 174, 007	21, 597, 528	18, 219, 362	16, 377, 293	17, 680, 862	14, 858, 974	11, 971, 702	9, 763, 497
Shell Union Oil Corporation	49, 518, 914	55, 874, 896	47, 368, 514	45, 012, 529	37, 368, 873	37, 172, 214	35, 739, 389	35, 096, 776	41, 116, 393	36, 459, 878
Skelly Oil Co	7, 633, 303	8, 084, 582	7, 030, 761	6, 790, 989	5, 616, 664	6, 446, 241	4, 343, 883	5, 528, 250	3, 971, 606	4, 541, 709
Socony-Vacuum Oil Co	52, 407, 530	54, 099, 870	49, 895, 226	46, 905, 365	43, 955, 860	42, 816, 819	39, 295, 673	42, 792, 408	38, 566, 279	40, 989, 483
Standard Oil Co. (Indiana)	68, 269, 617	81, 129, 033	68, 429, 429	58, 180, 039	57, 897, 829	56, 309, 583	44, 167, 426	47, 565, 371	80, 094, 618	71, 183, 504
Standard Oil Co. (New Jersey) [1]	106, 793, 455	112, 824, 034	87, 686, 445	72, 176, 685	75, 065, 668	82, 176, 020	86, 799, 179	82, 760, 146	92, 499, 592	105, 300, 438
Standard Oil Co. (Ohio)	19, 896, 595	17, 327, 030	15, 059, 537	13, 369, 651	11, 913, 018	10, 610, 398	9, 859, 947	11, 994, 332	8, 756, 774	9, 792, 043
Sun Oil Co	24, 112, 083	25, 910, 780	24, 481, 476	20, 250, 620	17, 443, 769	16, 177, 786	14, 157, 845	11, 286, 568	7, 365, 956	11, 436, 328
Texas Corporation	66, 946, 126	73, 143, 896	61, 195, 542	54, 133, 222	47, 016, 311	43, 868, 643	31, 826, 228	37, 109, 953	29, 164, 494	34, 984, 622
Tide Water Associated Oil Co	40, 378, 171	36, 331, 836	35, 305, 010	26, 331, 317	22, 400, 972	27, 263, 551	23, 557, 083	30, 064, 603	26, 956, 508	37, 299, 368
Union Oil Co. of California	19, 932, 599	18, 112, 290	17, 916, 758	15, 059, 683	14, 061, 237	12, 914, 663	16, 691, 805	16, 800, 349	22, 570, 671	28, 770. 209

[1] The preliminary analysis does not indicate whether or not imports are included in the purchases.

Source: Temporary National Economic Committee Questionnaire for Oil Companies. Standard Oil Co. of California and Mid-Continent Petroleum Corporation did not answer the Committee's questionnaire.


POSTED PRICES OF CRUDE OIL
FROM 1919
PRICE OF AVERAGE GRAVITY OF CRUDE IN DISTRICTS
HUMBLE OIL & REFINING COMPANY POSTINGS
PRICE PER BARREL IN CENTS
EAST TEX
REFUGIO 25° G
CARSON HUTCHINSON
WEST TEXAS 32°
MIRANDO 21° GR
GRAY COUNTY 42°
EAST CENTRAL TEXAS 37° GRAVITY
NORTH AND WEST CENTRAL TEXAS 36° GRAVITY
TEXAS GULF COAST 29° GRAVITY

(Face p. 71)



U. S. GOVERNMENT PRINTING OFFICE, 1940 — O-278923

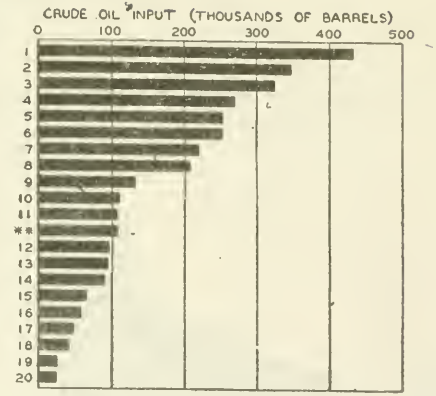
CHART VII

DAILY CRUDE OIL REFINING CAPACITY*

20 MAJOR COMPANIES AND "ALL OTHER" COMPANIES AS OF JANUARY 1, 1938

(MEASURED IN BARRELS OF CRUDE OIL INPUT)

NAME OF COMPANY	CRUDE OIL INPUT — BARRELS	PERCENT OF TOTAL — ACTUAL	PERCENT OF TOTAL — CUMULATIVE
1. STANDARD OIL CO. (NEW JERSEY)	432,200	9.9	9.9
2. SOCONY-VACUUM OIL CO., INC.	347,400	8.0	17.9
3. THE TEXAS CORP.	324,500	7.4	25.3
4. STANDARD OIL CO. (INDIANA)	269,100	8.2	31.5
5. STANDARD OIL CO. OF CALIF.	251,500	5.8	37.3
6. SHELL-UNION OIL CORP.	251,200	5.8	43.1
7. GULF OIL CORP.	219,000	5.0	48.1
8. CONSOLIDATED OIL CORP.	208,000	4.8	52.9
9. TIDEWATER ASSOCIATED OIL CO.	132,000	3.0	55.9
10. CITIES SERVICE CO.	110,500	2.5	58.4
11. ATLANTIC REFINING CO.	107,000	2.5	60.9
** RICHFIELD OIL CORP.	107,000	2.5	63.4
12. THE PURE OIL CO.	95,500	2.2	65.6
13. UNION OIL CO. OF CALIF.	94,200	2.2	67.8
14. SUN OIL CO.	89,000	2.0	69.8
15. PHILLIPS PETROLEUM CO.	64,000	1.5	71.3
16. STANDARD OIL CO. (OHIO)	56,100	1.3	72.6
17. CONTINENTAL OIL CO.	46,250	1.0	73.6
18. MID-CONTINENT PETROLEUM CORP.	40,000	0.9	74.5
19. THE OHIO OIL CO.	24,000	0.6	75.1
20. SKELLY OIL CO.	23,000	0.5	75.6
TOTAL TWENTY COMPANIES	3,291,450	75.6	
"ALL OTHER" COMPANIES	1,059,701	24.4	
TOTAL ALL COMPANIES	4,351,151	100.0	



REFINING CAPACITY OWNED BY:

* IN GENERAL, THE CAPACITY OF A REFINERY REPRESENTS THE MAXIMUM DAILY AVERAGE CRUDE THROUGHPUT (INPUT) OF THE PLANT IN COMPLETE OPERATION, WITH DUE ALLOWANCE FOR TIME CLOSED DOWN.

** CONTROLLED BY CONSOLIDATED OIL CORPORATION AND CITIES SERVICE COMPANY THROUGH OWNERSHIP OF COMMON STOCK, DEBENTURES, AND WARRANTS.

SOURCE: U. S. BUREAU OF MINES

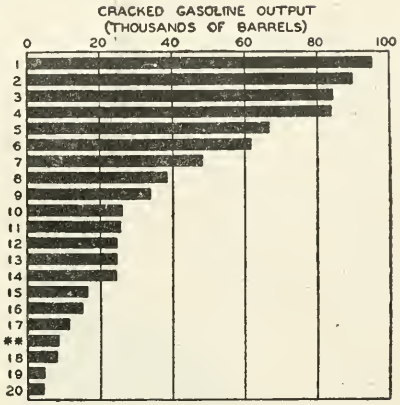
CHART VIII

DAILY CAPACITY OF CRACKING PLANTS*

20 MAJOR COMPANIES AND "ALL OTHER" COMPANIES AS OF JANUARY 1, 1938

(MEASURED IN BARRELS OF CRACKED GASOLINE OUTPUT)

NAME OF COMPANY	CRACKED GASOLINE OUTPUT BARRELS	PERCENT OF TOTAL ACTUAL	PERCENT OF TOTAL CUMULATIVE
1. STANDARD OIL CO. (NEW JERSEY)	95,254	10.2	10.2
2. SHELL UNION OIL CORP.	89,800	9.6	19.8
3. THE TEXAS CORP.	84,300	9.0	28.8
4. STANDARD OIL CO. (INDIANA)	83,890	9.0	37.8
5. GULF OIL CORP.	66,600	7.2	45.0
6. SOCONY-VACUUM OIL CO., INC.	61,650	6.6	51.6
7. CONSOLIDATED OIL CORP.	48,300	5.2	56.8
8. STANDARD OIL CO. OF CALIF.	38,500	4.1	60.9
9. THE PURE OIL CO.	33,800	3.6	64.5
10. ATLANTIC REFINING CO.	26,000	2.8	67.3
11. PHILLIPS PETROLEUM CO.	25,500	2.7	70.0
12. SUN OIL CO.	24,500	2.6	72.6
13. CITIES SERVICE CO.	24,349	2.6	75.2
14. STANDARD OIL CO. (OHIO)	24,300	2.6	77.8
15. TIDE WATER ASSOCIATED OIL CO.	18,400	1.8	79.6
16. SKELLY OIL CO.	15,000	1.6	81.2
17. CONTINENTAL OIL CO.	11,384	1.2	82.4
** RICHFIELD OIL CORP.	8,400	0.9	83.3
18. MID-CONTINENT PETROLEUM CORP.	8,000	0.9	84.2
19. UNION OIL CO. OF CALIF.	4,600	0.5	84.7
20. THE OHIO OIL CO.	4,395	0.5	85.2
TOTAL TWENTY COMPANIES	794,922	85.2	
"ALL OTHER" COMPANIES	138,049	14.8	
TOTAL ALL COMPANIES	932,971	100.0	



* THE CAPACITY OF CRACKING PLANTS IS THE MAXIMUM DAILY PRODUCTION OF CRACKED GASOLINE.

** CONTROLLED BY CONSOLIDATED OIL CORPORATION AND CITIES SERVICE COMPANY THROUGH OWNERSHIP OF COMMON STOCK, DEBENTURES, AND WARRANTS.

SOURCE: U. S. BUREAU OF MINES

CHART IX

ANNUAL CRUDE OIL RUNS TO STILLS AND PRODUCTION OF GASOLINE FOR UNITED STATES

20 MAJOR COMPANIES AND "ALL OTHER" COMPANIES
1926, 1931, 1935-37

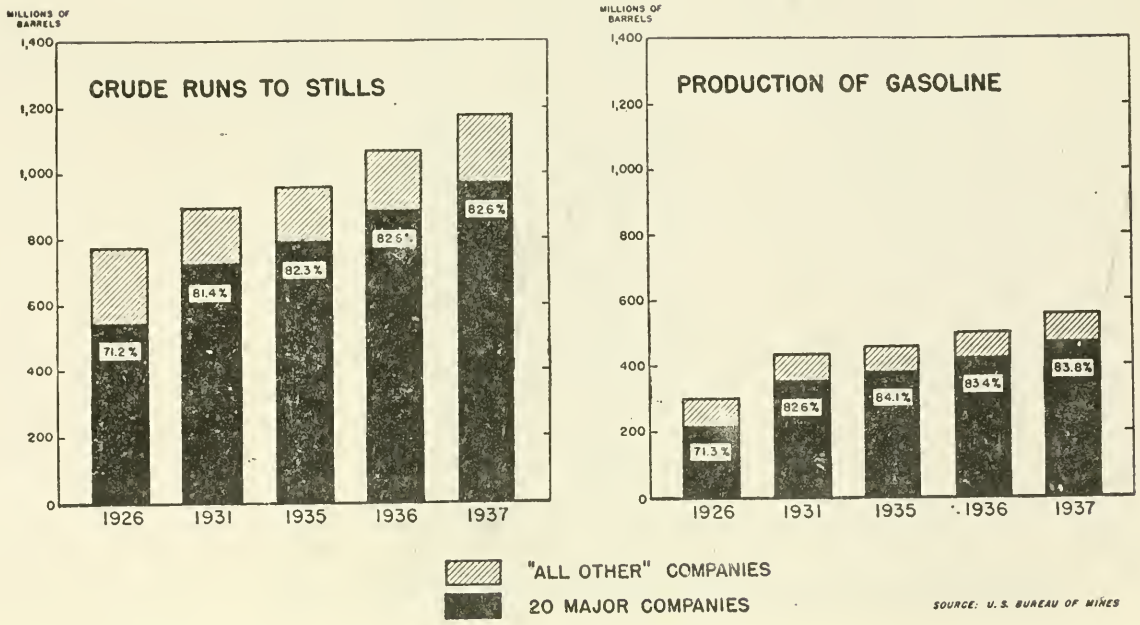


TABLE 11.—*Crude oil runs to stills in domestic refineries by major oil companies, by years, 1929–38*

[Thousands of 42-gallon barrels]

Name of company	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
United States, total	1,165,015	1,183,440	1,068,570	965,790	895,636	861,254	819,997	894,608	927,447	987,708
19 companies, total	933,185	960,513	883,523	796,122	738,116	709,738	677,169	724,857	731,055	[2]686,860
Atlantic Refining Co. (The)	34,521	35,276	33,258	30,203	29,161	26,848	25,532	27,730	25,959	26,221
Cities Service Co	33,417	33,276	30,544	28,873	25,945	26,259	24,422	26,849	18,899	14,686
Consolidated Oil Corporation	64,616	65,040	58,000	53,787	46,708	45,782	36,263	35,628	36,358	35,729
Continental Oil Co	13,805	14,426	13,396	12,281	13,504	12,434	10,196	14,290	12,331	[3]
Gulf Oil Corporation of Pennsylvania	76,086	77,894	71,686	61,681	56,333	55,689	53,449	65,616	67,697	67,978
Ohio Oil Co. (The)	5,772	6,116	5,993	5,440	4,813	4,828	5,058	6,512	3,583	2,366
Phillips Petroleum Co	15,812	15,709	13,700	13,179	12,646	12,015	10,560	9,123	4,546	2,888
Pure Oil Co. (The)	25,040	28,621	26,780	26,258	23,735	23,660	23,128	22,119	17,703	17,726
Shell Union Oil Corporation	82,835	84,451	82,788	76,329	65,793	66,885	59,504	62,072	67,176	75,476
Skelly Oil Co	7,374	7,180	6,769	6,034	5,130	4,903	4,227	4,992	5,020	4,620
Socony-Vacuum Oil Co	96,115	100,635	91,601	82,490	77,480	70,536	68,376	73,118	75,551	75,473
Standard Oil Co. of California [1]	49,532	53,772	49,992	44,737	42,714	40,755	42,762	45,680	51,975	[3]
Standard Oil Co. (Indiana)	86,992	86,989	74,686	66,057	56,649	49,833	47,236	54,858	58,917	68,428
Standard Oil Co. (New Jersey)	135,756	144,044	129,836	116,266	118,853	116,728	117,089	122,694	132,757	146,655
Standard Oil Co. (Ohio)	15,739	14,673	14,080	12,711	12,010	11,909	12,348	13,141	9,703	9,823
Sun Oil Co	25,780	25,861	24,464	22,856	22,207	20,288	18,555	18,291	16,006	12,890
Texas Corporation (The)	94,715	96,303	87,958	76,132	70,928	64,894	59,395	58,504	57,435	57,323
Tide Water Associated Oil Co	44,107	43,965	42,122	38,991	34,428	34,649	35,582	38,542	41,238	48,854
Union Oil Co. of California	25,171	26,281	25,869	21,817	19,080	20,843	23,495	25,098	28,201	31,725

[1] Moody's Manuals of Investments.
[2] 17 companies.
[3] Not available.

Sources: Temporary National Economic Committee Questionnaire for Oil Companies. The Mid-Continent Petroleum Corporation and the Standard Oil Co. of California did not answer the questionnaire.

TABLE 12.—*Gasoline manufactured by major oil companies (including natural gasoline used in blending), by years, 1929–38*

(In 42-gallon barrels)

Name of company	1938	1937	1936	1935	1934
Total	421,711,479	419,229,110	377,886,726	350,932,151	313,641,335
Atlantic Refining Co	17,004,677	16,703,101	15,401,991	14,776,082	13,772,783
Cities Service Co	16,550,810	17,455,[illegible]1	16,161,893	15,753,142	13,570,055
Consolidated Oil Corporation	33,411,000	33,058,[illegible]0	28,267,000	26,381,000	22,298,000
Continental Oil Co	9,641,996	9,601,[illegible]08	8,925,385	8,836,260	8,962,982
Gulf Oil Corporation of Pennsylvania	32,832,239	32,514,545	28,599,676	25,558,108	22,934,298
Ohio Oil Co	3,324,804	3,498,887	3,464,793	3,177,194	2,892,665
Phillips Petroleum Co	14,483,231	14,150,672	12,300,239	11,775,105	10,836,614
Pure Oil Co	13,231,093	15,991,467	14,298,991	13,791,335	10,910,555
Shell Union Oil Corporation	40,418,160	39,174,181	37,552,442	33,377,006	28,945,246
Skelly Oil Co	4,547,060	4,402,059	4,110,529	3,882,638	3,488,970
Socony-Vacuum Oil Co	39,975,410	41,519,376	38,580,292	34,067,333	31,701,256
Standard Oil Co. (Indiana)	47,696,087	47,580,595	39,062,140	35,855,570	30,678,035
Standard Oil Co. (New Jersey)	51,077,466	46,144,746	41,060,271	41,655,764	37,977,703
Standard Oil Co. (Ohio)	8,618,490	8,264,112	7,371,519	6,865,396	6,476,235
Sun Oil Co	12,192,760	11,769,430	10,927,381	10,407,820	9,868,445
Texas Corporation	50,399,439	50,582,880	45,969,560	40,708,296	36,743,213
Tide Water Associated Oil Co	19,371,111	19,927,330	18,891,008	17,348,726	15,904,518
Union Oil Co. of California	6,935,646	6,891,360	6,941,616	6,715,376	5,679,762

Name of company	1933	1932	1931	1930	1929
Total	307,715,718	306,273,455	329,209,624	320,927,700	318,366,448
Atlantic Refining Co	13,342,650	13,066,546	13,843,103	11,107,427	11,712,224
Cities Service Co	13,128,205	12,993,607	14,672,051	9,435,631	5,795,326
Consolidated Oil Corporation	22,406,000	19,188,000	20,038,000	20,962,000	20,140,000
Continental Oil Co	8,110,167	7,289,485	9,109,608	6,793,657	[1] 7,502,791
Gulf Oil Corporation of Pennsylvania	21,507,431	22,309,657	26,266,472	25,245,761	23,808,033
Ohio Oil Co	2,603,721	2,443,263	3,131,413	1,751,371	1,456,316
Phillips Petroleum Co	10,200,624	9,154,479	8,213,879	3,495,176	1,348,515
Pure Oil Co	11,363,544	11,837,521	11,549,814	9,198,802	8,562,802
Shell Union Oil Corporation	26,935,643	29,423,043	29,721,212	39,643,303	39,795,718
Skelly Oil Co	3,255,023	2,918,006	3,361,689	3,208,938	2,940,899
Socony-Vacuum Oil Co	30,658,418	29,851,390	32,261,256	30,361,351	30,943,948
Standard Oil Co. (Indiana)	27,816,295	27,577,237	32,665,430	34,193,978	37,529,499
Standard Oil Co. (New Jersey)	44,285,420	48,017,483	51,673,127	56,081,043	56,701,892
Standard Oil Co. (Ohio)	6,447,364	6,860,122	7,433,348	5,737,355	5,205,502
Sun Oil Co	8,708,602	8,078,661	7,655,802	6,376,254	5,212,528
Texas Corporation	34,463,722	32,563,181	33,546,755	31,262,224	31,500,258
Tide Water Associated Oil Co	15,645,771	14,941,120	16,101,697	15,986,063	17,713,708
Union Otil Co. of California	6,837,028	7,760,654	7,964,968	10,087,366	10,496,489

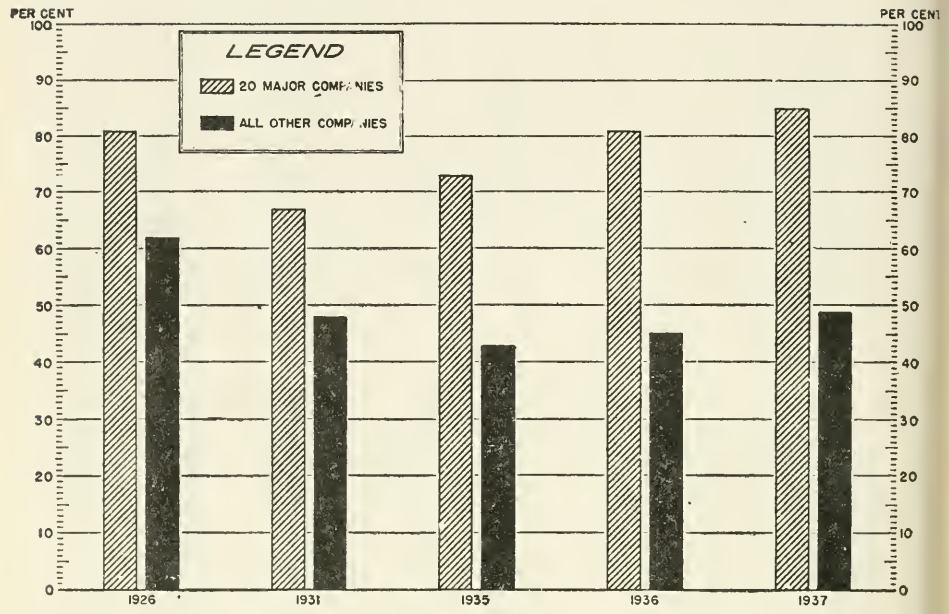
[1] Estimated figure.

Source: Temporary National Economic Committee Questionnaire for Oil Companies. The Standard Oil Co. of California and the Mid-Continent Petroleum Corporation did not answer the committee's questionnaire.

CHART X

REFINERY ACTIVITY*

20 MAJOR OIL COMPANIES AND ALL OTHER COMPANIES BY YEARS, 1926, 1931, 1935-1937



SOURCE: U. S. BUREAU OF MINES.
*MEASURED BY THE PER CENT "CRUDE OIL RUNS TO STILLS" IS OF REFINING CAPACITY

TABLE 13.—*Refinery operations of 20 major oil companies and all other companies, by years, 1926, 1931, 1935–37* [1]

Year	20 major oil companies			All other oil companies		
	Crude oil capacity [2]	Crude oil runs to stills	Percent of capacity [3]	Crude oil capacity [2]	Crude oil runs to stills	Percent of capacity [3]
[illegible]	1, 146, 994	977, 016	85	420, 637	206, 424	49
[illegible]	1, 088, 065	882, 747	81	414, 657	185, 823	45
1935	1, 081, 751	794, 368	73	399, 602	171, 422	43
1931	1, 090, 656	727, 914	67	348, 424	166, 694	48
1926	681, 619	555, 064	81	359, 714	224, 200	62

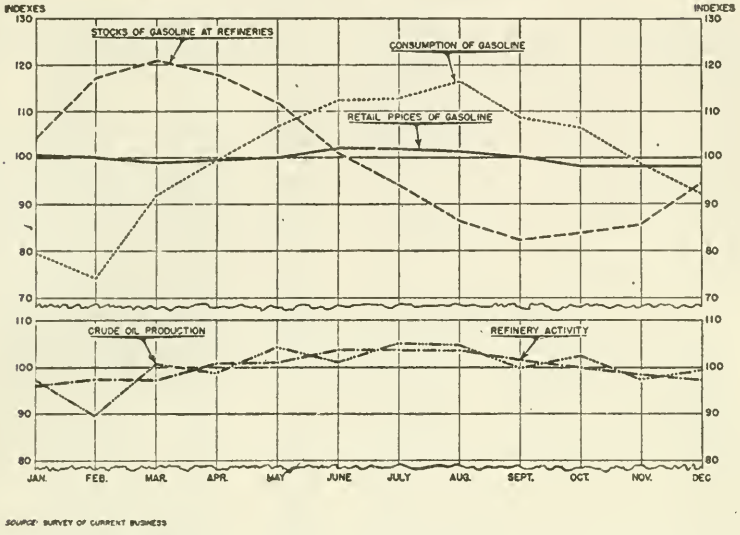
[1] Source: U. S. Bureau of Mines.
[2] Maximum daily crude oil throughput as of Jan. 1, inflated to annual refinery capacity basis; includes some shut-down plants.
[3] The percent crude oil runs to stills [illegible] of crude oil capacity.

CHART XI

SEASONAL TRENDS OF SELECTED PHASES OF THE PETROLEUM INDUSTRY

UNITED STATES

BASED ON THE 10-YEAR AVERAGE OF MONTHLY INDEXES FROM 1929 TO 1938



SOURCE: SURVEY OF CURRENT BUSINESS

TABLE 14.—*Seasonal trends of selected phases of the petroleum industry, based on the 10-year average of monthly indexes from 1929 to 1938, United States*

Month	Crude oil production	Refinery activity	Consumption of gasoline	Stocks of gasoline at refineries	Retail prices of gasoline
January	97.2	96.0	79.6	104.2	100.6
February	89.6	97.6	74.3	117.0	100.2
March	100.5	97.2	92.0	120.8	99.0
April	98.7	100.7	99.5	117.7	99.7
May	104.3	100.9	106.8	111.9	100.1
June	101.0	103.6	112.4	101.1	102.2
July	105.1	103.4	112.7	94.2	102.0
August	104.7	103.3	116.4	86.5	101.5
September	99.7	101.3	108.8	82.4	100.2
October	102.6	99.8	106.5	84.0	98.2
November	97.3	98.3	98.7	85.8	98.2
December	99.3	97.1	92.2	94.5	98.3

Source: Survey of Current Business.

TABLE 15.—*Purchases of gasoline by major oil companies, by years, 1929–38*

[In 42-gallon barrels]

Name of company	1938	1937	1936	1935	1934
Total	33,070,914	41,128,697	35,187,091	32,459,040	27,480,074
Atlantic Refining Co	313,922	424,828	367,526	210,186	220,602
Cities Service Co	1,606,501	2,323,857	854,004	2,533,695	1,552,701
Consolidated Oil Corporation	1,677,000	2,631,000	4,284,000	4,130,000	1,846,000
Continental Oil Co	1,718,667	1,978,309	1,691,935	1,877,299	1,836,892
Gulf Oil Corporation of Pennsylvania	1,411,746	3,480,148	3,252,301	1,778,310	1,972,616
Ohio Oil Co	494,865	317,413	124,160	304,699	330,862
Phillips Petroleum Co	267,512	296,089	263,264	436,294	74,883
Pure Oil Co	1,514,932	1,497,688	1,256,612	921,707	702,632
Shell Union Oil Corporation	1,690,522	1,803,033	2,195,691	1,254,274	1,262,238
Skelly Oil Co	370,107	398,729	541,750	536,226	363,775
Socony-Vacuum Oil Co	9,225,424	8,291,579	8,354,321	8,192,281	8,030,438
Standard Oil Co. (Indiana)	703,810	1,243,268	1,673,058	1,024,858	1,023,556
Standard Oil Co. (New Jersey)	2,842,015	5,516,289	1,942,242	1,399,971	1,160,093
Standard Oil Co. (Ohio)	623,572	667,733	598,039	326,493	169,047
Sun Oil Co	4,620,049	4,970,031	3,857,365	3,911,116	3,190,573
Texas Corporation	1,274,033	2,249,295	1,068,100	851,366	1,099,200
Tide Water Associated Oil Co	2,100,512	2,471,933	2,677,969	2,439,283	2,288,028
Union Oil Co. of California	615,725	567,475	184,754	331,072	355,938

Name of company	1933	1932	1931	1930	1929
Total	34,372,629	35,544,351	43,189,491	51,698,661	52,073,212
Atlantic Refining Co	607,280	542,986	1,113,583	2,316,284	3,704,738
Cities Service Co	2,312,365	1,748,393	1,634,281	3,733,248	4,188,756
Consolidated Oil Corporation	1,571,000	1,574,000	1,502,000	1,470,000	889,000
Continental Oil Co	1,320,480	1,636,312	1,891,623	2,095,854	[1] 2,879,120
Gulf Oil Corporation of Pennsylvania	928,623	308,090	642,120	1,573,894	1,515,712
Ohio Oil Co	315,154	18,423	40,160	32,861	3,429
Phillips Petroleum Co	377,842	178,127	425,316	513,032	433,327
Pure Oil Co	942,061	320,908	216,307	274,054	642,088
Shell Union Oil Corporation	2,089,002	1,047,591	1,093,528	1,365,107	1,370,832
Skelly Oil Co	293,742	127,971	168,882	62,857	52,251
Socony-Vacuum Oil Co	6,923,175	9,143,657	12,347,892	13,161,507	12,970,181
Standard Oil Co. (Indiana)	8,684,991	10,770,766	11,511,567	9,817,032	4,530,809
Standard Oil Co. (New Jersey)	1,340,053	1,543,014	571,009	3,224,692	3,229,242
Standard Oil Co. (Ohio)	239,795	323,503	1,583,137	1,576,733	2,390,816
Sun Oil Co	3,769,810	2,837,821	3,031,582	4,196,155	4,377,765
Texas Corporation	443,792	456,976	2,380,138	239,778	525,035
Tide Water Associated Oil Co	2,177,998	2,850,451	2,972,966	5,733,454	8,015,242
Union Oil Co. of California	28,486	115,362	60,400	312,119	354,869

[1] Estimated figure.

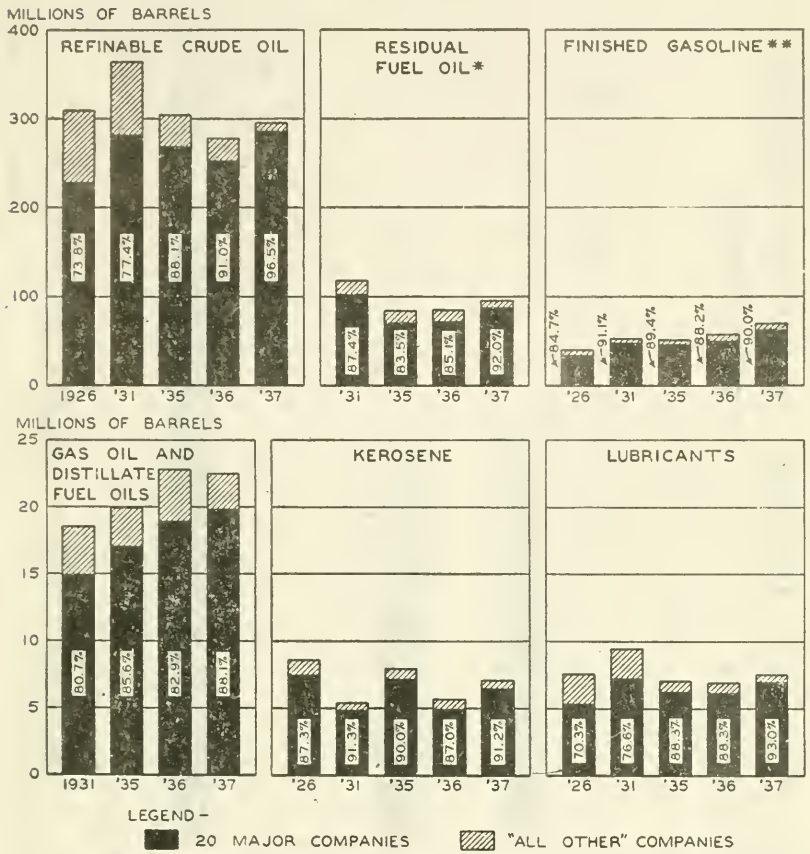
Purchases exclude imports, except in the cases of Cities Service Co. Standard Oil Co., (New Jersey) and Union Oil Co. of California where the preliminary analysis does not indicate whether or not imports are included in purchases.

Source: Temporary National Economic Committee Questionnaire for Oil Companies. Standard Oil Co. of California and Mid-Continent Petroleum Corporation did not answer the committee's questionnaire.

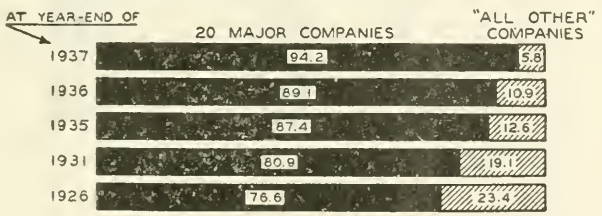
CHART XII

YEAR-END STOCKS OF CRUDE OIL AND PRINCIPAL PRODUCTS IN THE UNITED STATES

20 MAJOR COMPANIES AND "ALL OTHER" COMPANIES
1926, 1931, 1935-37



PERCENTAGES OF AGGREGATES OF THE SIX SELECTED STOCKS HELD BY:



* INCLUDING HEAVY CRUDE OIL FOR CALIFORNIA. COMPARABLE DATA NOT AVAILABLE FOR 1926

** FOR 1926, INCLUDES STOCKS AT REFINERIES ONLY; FOR OTHER YEARS, INCLUDES STOCKS AT REFINERIES, BULK TERMINALS, AND IN PIPE LINES

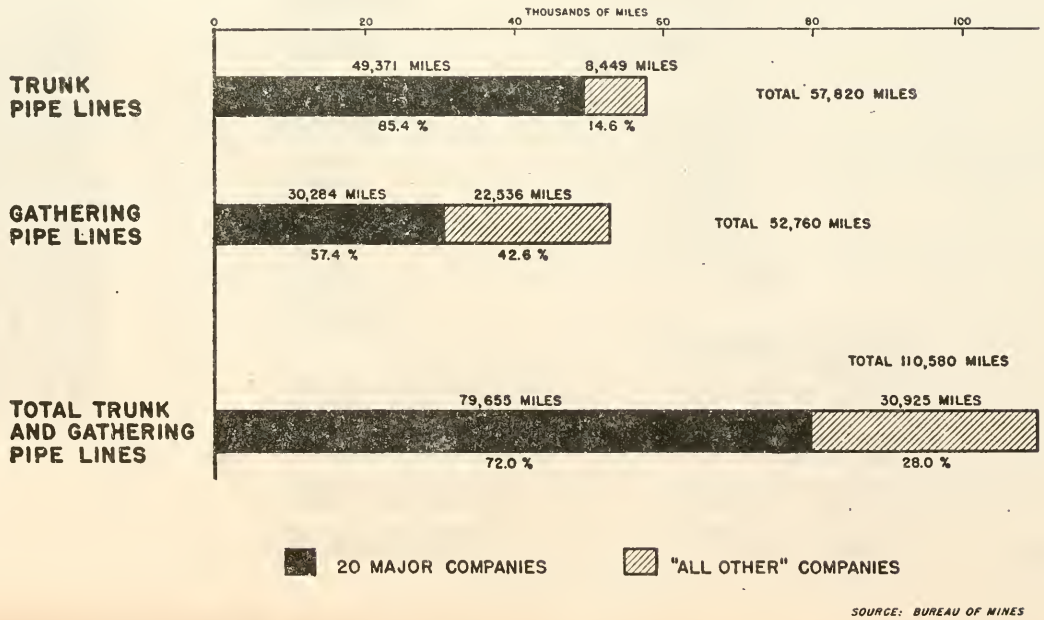
SOURCE: U. S. BUREAU OF MINES

CHART XIII

CRUDE OIL PIPE LINE MILEAGE IN UNITED STATES

20 MAJOR COMPANIES AND "ALL OTHER" COMPANIES

JUNE 30, 1936



SOURCE: BUREAU OF MINES

CRUDE OIL TRUNK PIPE LINES IN THE UNITED STATES
MAY 1939

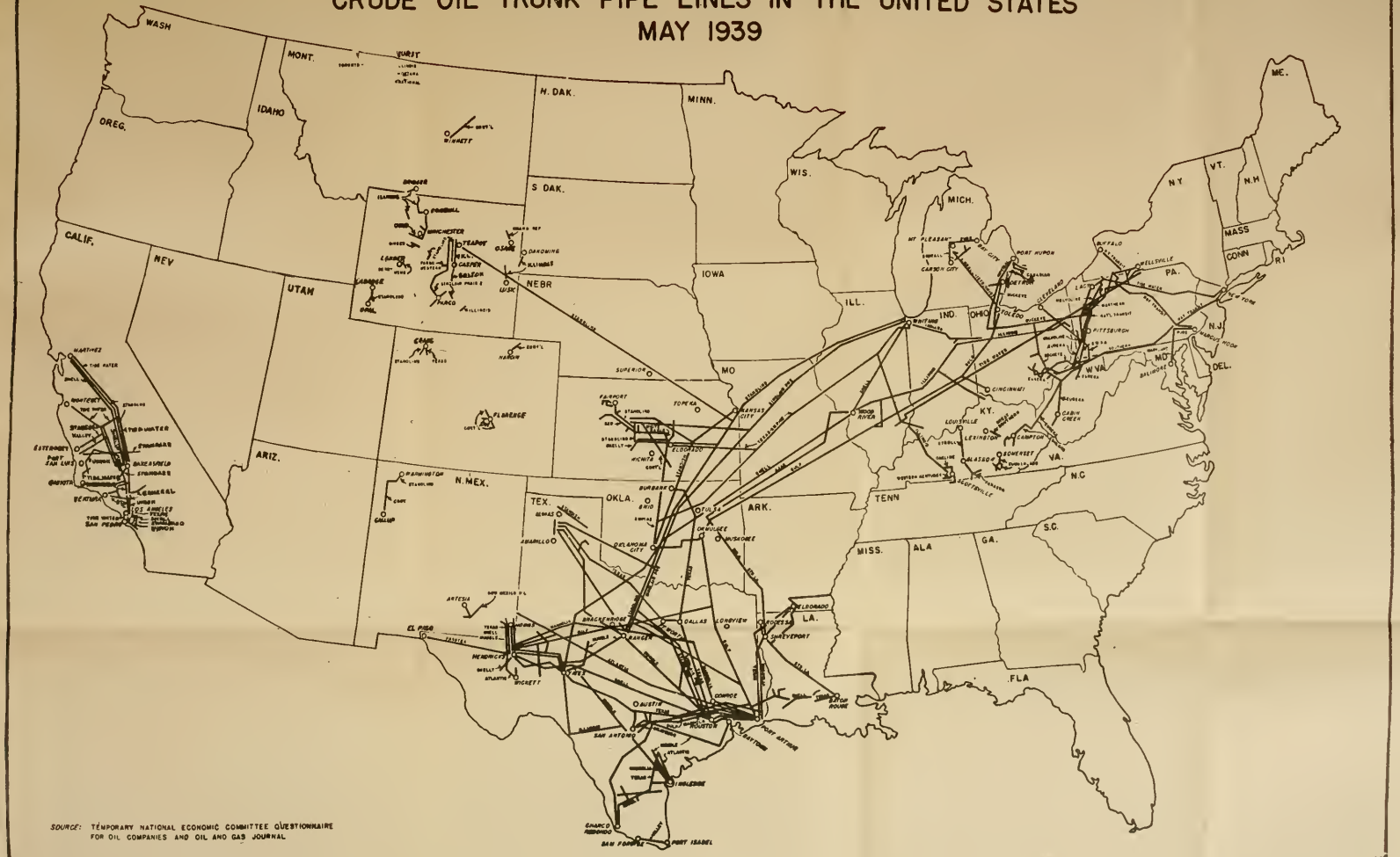


TABLE 16.—*Total crude oil pipe line mileage of major oil companies in the United States, Dec. 31 of the years 1928–38*

Name of company	1928		1929		1930		1931		1932		1933	
	Total mileage	Percent trunk	Total mileage	Percent trunk	Total mileage	Percent trunk	Total mileage	Percent trunk	Total mileage	Percent trunk	Total mileage	Percent trunk
Total	57,800	58.0	67,094	55.9	70,300	57.3	73,552	58.1	73,131	58.4	73,353	59.7
Atlantic Refining Co	820	73.8	834	75.3	938	75.4	1,343	72.8	1,285	76.0	1,314	74.3
Cities Service Co	842	59.5	884	55.5	1,364	49.0	1,526	48.0	1,532	47.5	1,535	47.4
Consolidated Oil Corporation	13,110	43.1	14,000	43.6	14,849	45.6	14,714	48.0	14,759	47.9	14,515	48.8
Continental Oil Co	(1)		1,422	(2)	1,410	(2)	1,616	(2)	1,503	(2)	1,495	(2)
Gulf Oil Corporation of Pennsylvania	5,968	63.7	6,290	67.5	6,480	69.2	7,200	71.3	7,265	71.6	7,342	71.9
Ohio Oil Co			4,928	37.2	5,822	35.2	5,749	33.9	5,668	34.2	5,114	45.2
Phillips Petroleum Co	102	(2)	113	(2)	789	32.4	1,041	29.9	1,058	34.9	1,365	42.1
Pure Oil Co	650	40.5	497	11.3	813	38.0	831	37.5	866	37.2	914	35.1
Shell Union Oil Corporation	3,085	(1)	3,683	(1)	3,746	84.3	3,808	83.0	3,833	82.0	3,843	82.5
Skelly Oil Co	403	(1)	411	(1)	470	(1)	574	(1)	537	(1)	517	(1)
Socony-Vacuum Oil Co., Inc	6,294	65.0	6,595	65.4	6,657	66.1	7,113	65.1	7,062	65.7	6,988	67.1
Standard Oil Co. (Indiana)	7,229	61.7	7,338	63.3	6,584	58.2	7,046	58.6	7,059	58.5	7,161	58.2
Standard Oil Co. (New Jersey)	10,590	63.2	10,667	64.2	10,792	65.3	10,886	67.7	10,842	68.1	10,758	68.7
Standard Oil Co. (Ohio)												
Sun Oil Co	326	52.1	330	51.8	260	65.8	420	60.7	453	62.5	482	59.1
Texas Corporation	5,497	59.6	6,106	64.1	6,209	65.1	6,362	66.1	6,146	65.9	6,179	65.4
Tide Water Associated Oil Co	2,019	74.3	2,098	71.2	2,210	72.3	2,345	70.5	2,344	70.4	2,919	68.5
Union Oil Co. of California	865	58.3	898	55.1	907	54.7	918	54.2	919	53.6	912	53.9

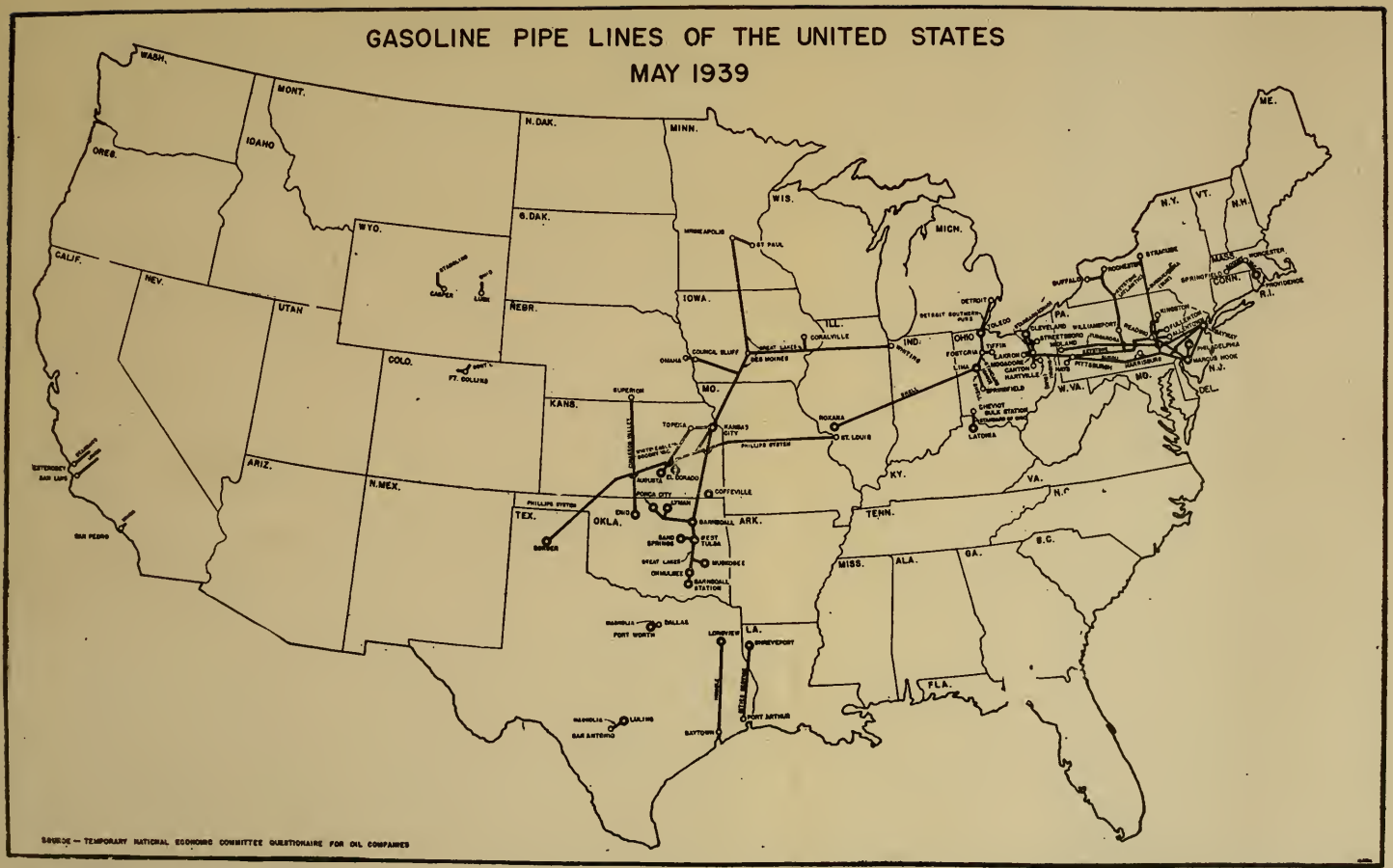
See footnotes at end of table.

TABLE 16.—*Total crude oil pipe line mileage of major oil companies in the United States Dec. 31 of the years 1928–38*—Continued

Name of company	1934		1935		1936		1937		1938	
	Total mileage	Percent trunk	Total mileage	Percent trunk	Total mileage	Percent trunk	Total mileage	Percent trunk	Total mileage	Percent trunk
Total	73,469	60.5	72,829	60.4	74,434	61.4	75,887	61.5		
Atlantic Refining Co	1,346	72.5	1,389	71.0	1,397	69.1	1,449	66.7	1,457	69.7
Cities Service Co	1,511	49.2	1,378	45.4	1,348	46.7	1,337	47.8	(1)	
Consolidated Oil Corporation	14,254	49.7	13,450	50.1	13,259	50.4	13,130	49.9	12,635	51.1
Continental Oil Co	1,474	(2)	1,467	(2)	1,692	(2)	1,682	(2)	1,920	12.4
Gulf Oil Corporation of Pennsylvania	7,314	71.9	7,361	70.4	7,762	74.0	7,961	72.5	8,022	72.2
Ohio Oil Co	5,021	45.7	4,921	46.7	4,808	45.1	4,814	45.1	4,808	44.9
Phillips Petroleum Co	1,318	46.1	1,428	44.5	1,221	50.9	1,306	55.1	1,279	57.9
Pure Oil Co	954	37.4	975	37.3	1,001	36.4	1,118	36.6	1,069	38.0
Shell Union Oil Corporation	3,845	81.6	3,819	80.9	4,108	82.0	4,226	83.0	4,283	82.6
Skelly Oil Co	565	(1)	607	(1)	642	(1)	666	(1)	668	(1)
Socony-Vacuum Oil Co., Inc	7,187	65.3	7,374	65.0	7,316	64.2	7,309	65.6	7,383	65.2
Standard Oil Co. (Indiana)	7,649	63.8	7,692	65.5	8,330	71.2	8,382	72.4	8,327	73.7
Standard Oil Co. (New Jersey)	10,537	70.3	10,383	70.5	10,345	71.0	10,902	69.6	(3)	
Standard Standard Oil Co. (Ohio)	12	(2)	140	(2)	385	39.0	500	31.8	(3)	
Sun Oil Co	501	56.5	520	54.4	641	47.4	646	47.1	654	47.9
Texas Corporation	6,370	63.6	6,272	63.0	6,373	61.6	6,565	60.4	6,846	60.3
Tide Water Associated Oil Co	2,704	67.8	2,751	66.7	2,911	67.2	2,983	71.1	(3)	
Union Oil Co. of California	907	54.4	902	54.7	895	54.5	911	53.7	919	52.9

[1] Not available from the company's records.
[2] Only gathering lines.
[3] Not reported.

Source: Temporary National Economic Committee Questionnaire for Oil Companies. Standard Oil Co. of California and Mid-Continent Petroleum Corporation did not answer the committee's questionnaire.


GASOLINE PIPE LINES OF THE UNITED STATES
MAY 1939
WASH.
ORE.
CALIF.
IDAHO
NEV.
MONT.
WYO.
UTAH
ARIZ.
COLO.
N.MEX.
N.DAK.
S.DAK.
NEBR.
KANS.
OKLA.
TEX.
MINN.
IOWA.
MO.
ARK.
LA.
WIS.
ILL.
MICH.
IND.
OHIO
KY.
TENN.
MISS.
ALA.
GA.
FLA.
S.C.
N.C.
VA.
W.VA.
PA.
N.Y.
MD.
DEL.
N.J.
CONN.
R.I.
MASS.
VT.
N.H.
ME.
SOURCE — TEMPORARY NATIONAL ECONOMIC COMMITTEE QUESTIONAIRE FOR OIL COMPANIES

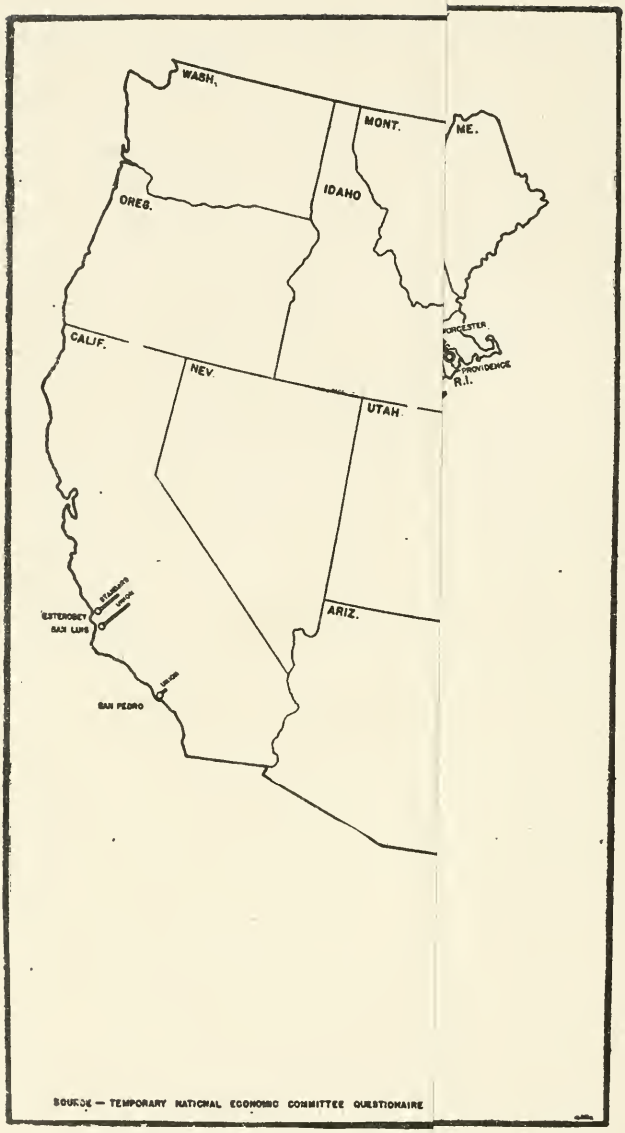


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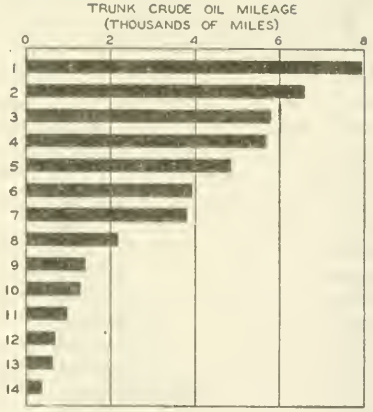
CHART XV

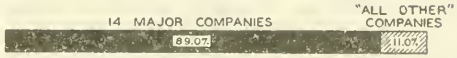
TRUNK CRUDE OIL PIPE-LINE MILEAGE IN THE UNITED STATES

AS REPORTED TO THE INTERSTATE COMMERCE COMMISSION *
14 MAJOR OIL COMPANIES AND "ALL OTHER" COMPANIES
AS OF JANUARY 1, 1938

NAME OF COMPANY	TRUNK CRUDE OIL MILEAGE		
	MILES	PERCENT OF TOTAL	
		ACTUAL	CUMULATIVE
1. STANDARD OIL CO. (NEW JERSEY)	7,960	15.4	15.4
2. CONSOLIDATED OIL CORP.	6,585	12.7	28.1
3. GULF OIL CORP.	5,772	11.2	39.3
4. STANDARD OIL CO. (INDIANA)	5,663	11.0	50.3
5. THE TEXAS CORP.	4,801	9.3	59.6
6. SHELL UNION OIL CORP.	3,900	7.6	67.2
7. SOCONY-VACUUM OIL CO.	3,792	7.3	74.5
8. OHIO OIL CO.	2,169	4.2	78.7
9. TIDE WATER ASSOCIATED OIL CO.	1,397	2.7	81.4
10. CITIES SERVICE CO.	1,284	2.5	83.9
11. ATLANTIC REFINING CO.	966	1.9	85.8
12. PHILLIPS PETROLEUM CO.	671	1.3	87.1
13. PURE OIL CO.	608	1.2	88.3
14. STANDARD OIL CO. (OHIO)	347	0.7	89.0
TOTAL 14 MAJOR COMPANIES	45,915	89.0	
"ALL OTHER" COMPANIES	5,654	11.0	
TOTAL ALL COMPANIES	51,569	100.0	



PERCENTAGE OF TRUNK CRUDE OIL PIPE-LINE MILEAGE OWNED OR CONTROLLED BY:



THE ONLY RECENT DATA SHOWING A SEGREGATION OF TRUNK LINE MILEAGE ARE THOSE OF THE I.C.C. HOWEVER, THE COVERAGE OF TRUNK LINES WHOSE OPERATIONS ARE REQUIRED BY LAW TO BE REPORTED TO THE I.C.C. OMITS CERTAIN WHOLLY INTRASTATE LINES. THE DEGREE OF OMISSION IS INDICATED BY COMPARISON WITH TOTAL PIPE-LINE MILEAGE REPORTED TO THE U.S. BUREAU OF MINES AS OF JUNE 30, 1938, WHICH WAS: TOTAL, 57,620 MILES; 20 MAJOR COMPANIES GROUP, 49,371 MILES. THEREFORE, THE COVERAGE GIVEN IN THIS TABLE IS APPROXIMATELY 93% OF TOTAL MILEAGE

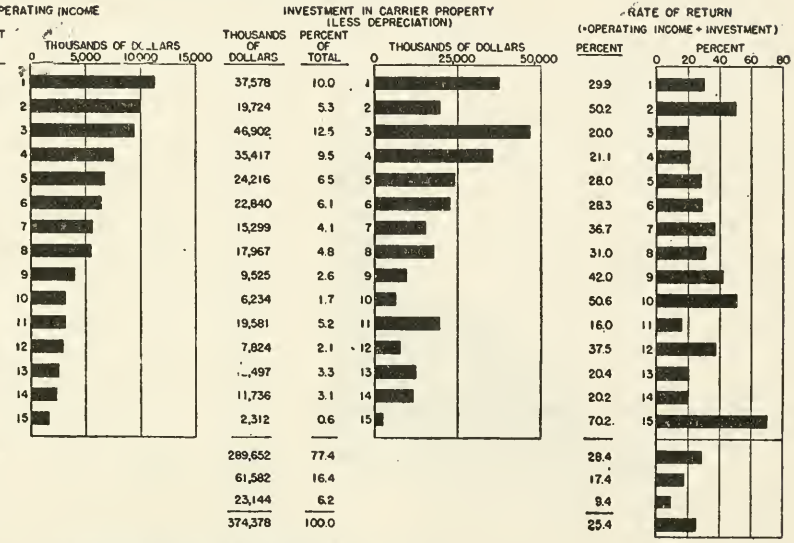
SOURCE: I.C.C. ANNUAL PIPE-LINE STATISTICS

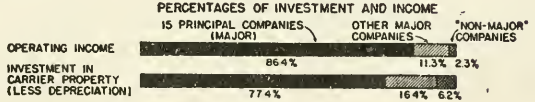
CHART XVII

INVESTMENT AND INCOME OF PIPE LINE COMPANIES

15 PRINCIPAL COMPANIES* AND OTHER COMPANIES
AS REPORTED TO INTERSTATE COMMERCE COMMISSION**
1938

	NAME OF COMPANY	OPERATING INCOME: THOUSANDS OF DOLLARS	OPERATING INCOME: PERCENT OF TOTAL	INVESTMENT IN CARRIER PROPERTY (LESS DEPRECIATION): THOUSANDS OF DOLLARS	INVESTMENT IN CARRIER PROPERTY (LESS DEPRECIATION): PERCENT OF TOTAL	RATE OF RETURN (OPERATING INCOME ÷ INVESTMENT): PERCENT
1	GULF REFINING CO.	11,244	11.8	37,578	10.0	29.9
2	SINCLAIR REFINING CO.	9,903	10.4	19,724	5.3	50.2
3	HUMBLE PIPE LINE CO.	9,393	9.9	46,902	12.5	20.0
4	STANOLIND PIPE LINE CO.	7,499	7.9	35,417	9.5	21.1
5	MAGNOLIA PIPE LINE CO.	6,773	7.1	24,216	6.5	28.0
6	SHELL PIPE LINE CORP.	6,469	6.8	22,840	6.1	28.3
7	TEXAS-EMPIRE PIPE LINE CO. (DEL.)	5,614	5.9	15,299	4.1	36.7
8	GREAT LAKES PIPE LINE CO.***	5,566	5.8	17,967	4.8	31.0
9	PHILLIPS PIPE LINE CO.***	3,999	4.2	9,525	2.6	42.0
10	ATLANTIC PIPE LINE CO.	3,156	3.3	6,234	1.7	50.6
11	TEXAS PIPE LINE CO. OF TEXAS	3,138	3.3	19,581	5.2	16.0
12	STANDARD OIL CO. OF LA.	2,931	3.1	7,824	2.1	37.5
13	ILLINOIS PIPE LINE CO.	2,552	2.7	12,497	3.3	20.4
14	TEXAS-NEW MEXICO PIPE LINE CO.	2,369	2.5	11,736	3.1	20.2
15	TEXAS-EMPIRE PIPE LINE CO. OF TEXAS	1,622	1.7	2,312	0.6	70.2
MAJOR COMPANIES	15 PRINCIPAL COMPANIES	82,228	86.4	289,652	77.4	28.4
MAJOR COMPANIES	28 OTHER COMPANIES	10,743	11.3	61,582	16.4	17.4
"NON-MAJOR" COMPANIES		2,170	2.3	23,144	6.2	9.4
TOTAL ALL COMPANIES		95,141	100.0	374,378	100.0	25.4





* ON THE BASIS OF OPERATING INCOME
** COVERAGE ESTIMATED AT APPROXIMATELY 65-80 PERCENT OF TOTAL INVESTMENT IN THE INDUSTRY
*** GASOLINE PIPE LINES

SOURCE: INTERSTATE COMMERCE COMMISSION REPORTS

TABLE 17.—*Gasoline pipe-line mileage owned and operated by major oil companies, Dec. 31 of years 1928–38*

Name of company	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Total	236	769	1,054	4,071	4,127	4,256	4,764	4,947	5,532	6,042	------
Atlantic Refining Co	------	------	200	226	226	226	408	536	815	815	818
Cities Service Co	186	186	186	186	186	186	186	186	186	186	186
Phillips Petroleum Co	------	------	------	766	764	764	736	736	736	799	799
Pure Oil Co	------	------	------	------	58	139	140	140	142	143	143
Shell Union Oil Corporation	------	------	------	------	------	------	------	------	------	------	410
Socony-Vacuum Oil Co	------	------	81	179	179	180	183	186	363	363	363
Standard Oil Co. (Indiana)	40	40	40	40	40	40	40	40	40	40	40
Standard Oil Co. (New Jersey)	------	533	534	534	534	534	534	536	536	544	[3]
Standard Oil Co. (Ohio)	------	------	------	------	------	------	------	------	------	39	192
Sun Oil Co	------	------	------	733	733	733	733	733	847	849	849
Tide Water Associated Oil Co	10	10	13	13	13	13	178	178	178	13	[3]
Union Oil Co. of California	[1]	[1]	[1]	147	146	149	146	158	171	170	175
Great Lakes Pipe Line Co.[2]	------	------	------	1,247	1,248	1,292	1,480	1,518	1,518	2,081	2,134

[1] Not available from the company's records.

[2] Jointly owned by Continental Oil Co., 29.2 percent; Mid-Continent Petroleum Corporation, 19.0 percent; Skelly Oil Co., 14.2 percent; the Texas Corporation, 12.1 percent; Pure Oil Co., 9.5 percent; Consolidated Oil Corporation, 5.8 percent; Cities Service Co., 5.2 percent; Phillips Petroleum Co., 5.0 percent.

Consolidated Oil Corporation, Continental Oil Co., Gulf Oil Corporation of Pennsylvania, Ohio Oil Co., Skelly Oil Co., and the Texas Corporation reported no gasoline pipe line owned or operated during the above years.

[3] Not reported.

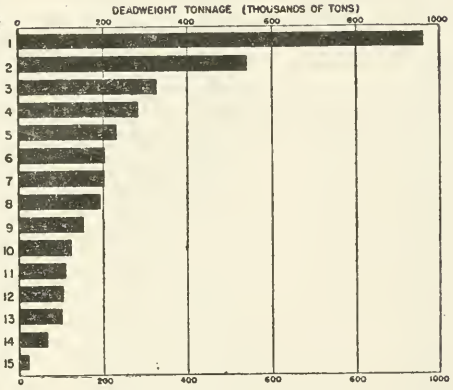
Source: Temporary National Economic Committee Questionnaire for Oil Companies; Standard Oil Co. of California and Mid-Continent Petroleum Corporation did not answer the committee's questionnaire.

CHART XVIII

NUMBER OF OIL TANKERS AND DEADWEIGHT TONNAGE OWNED BY AMERICAN COMPANIES UNDER AMERICAN REGISTRY*

SEPTEMBER 30, 1938

NAME OF COMPANY	NUMBER OF TANKERS NO.	NUMBER OF TANKERS PERCENT OF TOTAL	DEADWEIGHT TONNAGE TONS	DEADWEIGHT TONNAGE PERCENT OF TOTAL	DEADWEIGHT TONNAGE CUMULATIVE PERCENTAGE	
1. STANDARD OIL COMPANY (NEW JERSEY)	74	18.7	957,792	23.0	23.0	1
2. SOCONY-VACUUM OIL COMPANY, INC.	56	14.1	541,981	13.0	36.0	2
3. GULF OIL CORPORATION	29	7.3	329,090	7.9	43.9	3
4. THE TEXAS CORPORATION	27	6.8	282,411	6.8	50.7	4
5. SUN OIL COMPANY	18	4.5	231,369	5.6	56.3	5
6. ATLANTIC REFINING COMPANY	18	4.5	202,843	4.9	61.2	6
7. TIDE WATER ASSOCIATED OIL COMPANY	20	5.1	202,108	4.8	66.0	7
8. STANDARD OIL COMPANY OF CALIFORNIA	21	5.3	192,942	4.6	70.6	8
9. CITIES SERVICE COMPANY	14	3.5	158,580	3.8	74.4	9
10. PURE OIL COMPANY, INC.	16	4.0	124,432	3.0	77.4	10
11. STANDARD OIL COMPANY (INDIANA)	11	2.8	113,031	2.7	80.1	11
12. UNION OIL COMPANY OF CALIFORNIA	10	2.5	105,434	2.5	82.6	12
13. CONSOLIDATED OIL CORPORATION	10	2.5	101,712	2.4	85.0	13
14. RICHFIELD OIL CORPORATION**	7	1.8	68,780	1.7	86.7	14
15. CONTINENTAL OIL COMPANY	2	.5	22,005	.5	87.2	15
15 MAJOR COMPANIES	333	84.1	3,634,650	87.2		
"ALL OTHER" COMPANIES	63	15.9	533,800	12.8		
TOTAL	396	100.0	4,168,450	100.0		



PERCENTAGE OF TONNAGE OWNED BY:

* DATA FOR TANKERS UNDER FOREIGN REGISTRY OF AMERICAN AND FOREIGN COMPANIES ARE NOT INCLUDED IN THIS EXHIBIT. OF THE 20 MAJOR OIL COMPANIES OPERATING IN THE U.S. ONLY ROYAL DUTCH SHELL INTERESTS OPERATE TANKERS IN AMERICAN TRADE EXCLUSIVELY UNDER FOREIGN REGISTRY. THE SHELL GROUP OPERATES 206 TANKERS WITH AN AGGREGATE 1,703,000 DEADWEIGHT TONNAGE IN THEIR WORLD TRADE.

** CONTROLLED BY CONSOLIDATED AND CITIES SERVICE THROUGH OWNERSHIP OF COMMON STOCK, DEBENTURES AND WARRANTS.

SOURCES: U.S. MARITIME COMMISSION AND PETROLEUM CONSERVATION DIVISION, DEPT OF INTERIOR

TABLE 18.—*Rate of return on pipe line investment for oil companies reporting to the Interstate Commerce Commission, 1938*

Name of company	Investment in carrier property (after depreciation)	Pipe line operating income	Rate of return
Atlantic Refining Co	$6, 233, 850	$3, 156, 207	50. 6
Consolidated Oil Corp	19, 723, 862	9, 903, 257	50. 2
Tide Water Assoc. Oil Co.[1]	3, 315, 037	1, 244, 772	37. 5
Gulf Oil Corp. of Pa	37, 577, 912	11, 243, 968	29. 9
Jointly Owned Majors	37, 799, 548	10, 926, 650	28. 9
Shell Union Oil Corporation	22, 839, 860	6, 469, 098	28. 3
Socony-Vacuum Oil Co	24, 215, 540	6, 772, 627	28. 0
Phillips Petroleum Co	4, 594, 716	1, 082, 057	23. 6
Standard Oil Co. (Ind.)	36, 359, 957	8, 037, 903	22. 1
Pure Oil Co.[2]	5, 565, 170	1, 193, 638	21. 4
Ohio Oil Co.[3]	12, 512, 440	2, 555, 719	20. 4
Standard Oil Co. (N. J.)	63, 736, 798	12, 414, 427	19. 5
Standard Oil Co. (Ohio)	2, 321, 303	437, 917	18. 9
Texas Corporation	21, 293, 255	3, 707, 955	17. 4
Cities Service Co	4, 868, 758	406, 996	8. 4
Continental Oil Co	4, 246, 281	324, 083	7. 6
All major companies	307, 204, 287	79, 877, 274	26. 0
All independent companies	23, 144, 350	2, 170, 188	9. 4
All crude oil pipe lines	374, 377, 510	95, 140, 882	25. 4

[1] Includes Bradford Transit Co., 50 percent of whose stock is owned by South Penn Oil Co.
[2] Includes Bell General Transit Corporation.
[3] Includes Arkana Transit Corporation, 50 percent of whose stock is owned by Arkansas Fuel Oil Co. (a Cities Service subsidiary).

Source: Annual reports to the Interstate Commerce Commission.

TABLE 19.—*Domestic Marketing Territory of 20 Major Oil Companies, by States, May 1939*

State	Atl. Ref. Co.	Cities Serv. Co.	Cons. Oil Corp.	Cont. Oil Co.	Gulf Oil Corp. of Pa.	Mid-Cont. Pet. Corp.[1]	The Ohio Oil Co.	Phillips Pet. Co.	The Pure Oil Co.	Shell Union Oil Corp.	Skelly Oil Co.	Socony-Vacuum Oil Co.	Stand. Oil Co. of Cal.[2]	Stand. Oil Co. (Ind.)	Stand Oil Co. (N. J.)	Stand Oil Co. (Ohio)	Sun Oil Co.	The Tex: Corp.	Tide Water Assoc. Oil Co.	Union Oil Co. of Cal.	Total
Alabama		X	X		X				X	X				X				X			7
Arizona				X						X		X	X					X	X	X	7
Arkansas		X	X	X	X	X		X	X	X	X				X			X			11
California										X		X	X					X	X	X	6
Colorado		X	X	X		X		X			X	X		X				X			9
Connecticut	X	X	X	X	X				X	X		X		X	X		X	X	X		13
Delaware	X	X	X	X	X				X	X		X		X	X		X	X	X		13
D. C.			X	X	X					X		X			X		X	X	X		9
Florida	X	X	X	X	X				X	X				X			X	X			10
Georgia	X	X	X	X	X				X	X				X				X			9
Idaho			X	X						X		X	X	X				X	X	X	9
Illinois		X	X	X		X	X	X	X	X	X	X		X			X	X	X		14
Indiana		X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	X		16
Iowa		X	X	X		X	X	X	X	X	X	X		X				X	X		13
Kansas		X	X	X		X	X	X		X	X	X		X				X	X		12
Kentucky		X	X		X	X	X	X	X	X							X	X			10
Louisiana		X	X	X	X				X	X				X	X			X			9
Maine		X	X		X					X		X		X	X		X	X	X		10
Maryland	X	X	X	X	X				X	X		X		X	X	X	X	X	X		14
Massachusetts	X	X	X		X				X	X		X		X	X		X	X	X		12
Michigan		X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	X		16
Minnesota		X	X	X		X		X	X	X	X	X		X				X	X		12
Mississippi		X	X		X				X	X				X				X			7
Missouri		X	X	X		X	X	X		X	X	X		X				X	X		12
Montana				X		X		X		X		X		X				X	X		8
Nebraska		X	X	X		X		X	X	X	X	X						X	X		11
Nevada										X		X	X					X	X	X	6
New Hampshire	X	X	X		X					X		X		X	X		X	X	X		11
New Jersey	X	X	X	X	X				X	X		X		X	X		X	X	X		13
New Mexico			X	X				X		X	X		X					X			7
New York	X	X	X	X	X				X	X		X		X	X		X	X	X		13
North Carolina	X	X	X	X	X				X	X		X		X	X			X			11
North Dakota		X	X	X		X		X	X		X	X		X				X	X		11
Ohio	X	X	X	X	X		X	X	X	X		X		X		X	X	X			14
Oklahoma		X	X	X		X	X	X	X	X	X			X				X	X		12
Oregon				X						X		X	X					X	X	X	7
Pennsylvania	X	X	X	X	X				X	X		X		X	X	X	X	X	X		14
Rhode Island	X	X	X		X					X		X		X	X		X	X	X		11

South Carolina	X	X	X	X	X				X	X		X		X	X			X			11
South Dakota		X	X	X		X		X	X	X	X	X		X				X	X		12
Tennessee		X	X		X	X		X	X	X		X		X	X			X			11
Texas		X	X	X	X	X	X	X	X	X	X		X		X			X			13
Utah			X	X						X		X	X	X				X	X		8
Vermont	X	X	X		X					X		X		X	X		X	X	X		11
Virginia	X	X	X	X	X				X	X		X		X	X		X	X	X		13
Washington				X						X		X	X					X	X	X	7
West Virginia	X	X	X	X	X				X	X		X		X	X	X	X	X			13
Wisconsin		X	X	X		X		X	X	X	X	X		X				X	X		12
Wyoming			X	X		X		X		X	X	X		X				X			9
Total	17	38	43	38	28	19	10	21	31	47	17	39	9	38	20	6	20	49	33	6	529

[1] World Petroleum Register: Report on Pipe Lines, pt. 1, p. 106; and *United States* v. *Socony-Vacuum Oil Co., Inc., et al.* Transcript of the Record on Appeal, Seventh Circuit, Vol. VII, pp. 3812-16. Defense exhibit No. 1028.

[2] Moody's Manual of Investments, 1939.

Source: Temporary National Economic Committee Questionnaire for Oil Companies.

TABLE 20.—*Number of domestic bulk plants, by major oil companies, by years, 1929–38*

Name of company	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Total	19,783	19,749	19,803	19,609	19,540	19,426	19,240	19,443	17,396	15,646
Atlantic Refining Co	329	367	407	415	427	442	447	445	405	351
Cities Service Co	894	886	877	865	852	839	823	840	824	505
Consolidated Oil Corporation	2,169	2,187	2,201	2,224	2,199	2,100	2,086	2,075	------	------
Continental Oil Co	1,259	1,273	1,287	1,313	1,365	1,377	1,331	1,319	1,281	1,227
Gulf Oil Corporation of Pennsylvania	1,143	1,137	1,115	1,093	1,083	1,228	1,223	1,249	1,178	1,088
Ohio Oil Co	176	175	182	174	196	195	194	203	139	13
Phillips Petroleum Co	726	728	716	718	727	720	730	669	665	342
Pure Oil Co	5.7	43	549	518	485	404	357	295	239	191
Shell Union Oil Corporation	1,15	236	1,219	1,196	1,197	1,210	1,172	1,179	1,202	907
Skelly Oil Co	3	298	289	273	250	234	216	205	209	184
Socony-Vacuum Oil Co	2,087	2,079	2,065	2,012	1,996	1,990	1,997	2,078	2,091	1,981
Standard Oil Co. (Indiana)	4,659	4,627	4,725	4,698	4,722	4,760	4,708	4,842	4,986	4,759
Standard Oil Co. (New Jersey)	962	979	991	1,028	1,082	1,083	1,088	1,228	1,395	1,372
Standard Oil Co. (Ohio)	174	176	174	168	168	179	197	223	241	299
Sun Oil Co	108	109	121	119	119	114	117	114	97	77
Texas Corporation	2,231	2,133	2,070	1,994	1,904	1,869	1,823	1,766	1,751	1,720
Tide Water Associated Oil Co	399	384	381	365	332	308	303	291	274	230
Union Oil Co. of California	437	432	434	436	436	434	428	422	419	400

Source: Temporary National Economic Committee Questionnaire for Oil Companies. The Standard Oil Co. of California and the Mid-Continent Petroleum Corporation did not answer the committee's questionnaire.

TABLE 21.—*Number of domestic service stations, by major oil companies, by years, 1929–38*

Name of Company	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Total	69,666	66,052	59,371	75,547	98,246	125,327	123,209	118,280	79,037	33,704
Atlantic Refining Co	131	57	113	261	572	597	580	586	518	394
Cities Service Co	2,515	2,579	2,198	2,317	2,528	2,733	2,869	2,972	2,778	1,031
Consolidated Oil Corporation	9,611	8,577	7,615	9,172	11,039	15,401	14,244	11,848	------	------
Continental Oil Co	1,666	1,681	1,597	1,821	5,314	7,101	5,814	5,066	3,138	1,332
Gulf Oil Corporation of Pennsylvania	7,438	7,147	4,873	3,750	3,115	5,613	10,174	13,290	8,356	1,793
Ohio Oil Co	15	15	14	27	91	339	324	270	201	134
Phillips Petroleum Co	1,572	1,553	1,501	1,497	1,534	1,576	1,490	1,307	914	380
Pure Oil Co., The	36	45	92	579	1,071	1,058	952	765	656	464
Shell Union Oil Corporation	6,527	6,494	6,266	6,976	8,309	9,766	8,623	7,540	5,955	3,082
Skelly Oil Co	630	582	574	538	484	428	388	347	334	285
Socony-Vacuum Oil Co	9,045	8,985	7,414	9,852	13,775	17,355	18,406	19,216	15,542	6,702
Standard Oil Co. (Indiana)	11,241	9,954	8,387	9,004	12,538	13,998	13,556	14,302	11,635	9,187
Standard Oil Co. (New Jersey)	417	505	895	7,981	12,250	17,717	17,012	16,864	11,602	156
Standard Oil Co. (Ohio)	2,314	2,241	2,173	1,957	2,188	2,742	2,696	2,713	2,023	1,418
Sun Oil Co	682	701	681	677	648	523	474	462	405	345
Texas Corporation	9,607	8,857	8,921	13,143	17,121	22,713	23,459	18,666	12,823	5,571
Tide Water Association Oil Co	2,166	2,058	1,948	1,794	1,514	1,367	1,233	1,118	1,127	880
Union Oil Co. of California	4,053	4,021	4,109	4,201	4,155	4,300	915	948	1,030	550

Source: Temporary National Economic Committee Questionnaire for Oil Companies. The Standard Oil Co. of California and the Mid-Continent Petroleum Corporation did not answer the committee's questionnaire.

TABLE 22.—*Total domestic sales of gasoline by major oil companies, by States, 1938*

[42-gallon barrels]

	Atlantic Refining Co.	Cities Service Co.	Consolidated Oil Corporation	Continental Oil Co.	Gulf Oil Corporation of Pennsylvania	Ohio Oil Co.	Phillips Petroleum Co.	Pure Oil Co.	Shell Union Oil Corporation
Alabama		168,741	464,396		799,386		57,867	829,000	305,137
Arizona				178,876					327,441
Arkansas		342,845	398,231	172,418	396,841		99,554	31,000	130,067
California	21						2,627		5,325,145
Colorado		84,120	514,545	990,992	79,114		274,566		214,483
Connecticut	442,214	284,752	575,254	37,921	690,310			16,000	600,808
Delaware	260,881	12,886	46,431	189	181,558			115,000	8,723
District of Columbia	143	73,350	122,647	86,769	301,543				174,794
Florida	176,976	715,120	713,427	11,563	1,321,327			787,000	527,847
Georgia	356,167	170,835	751,141	21,317	1,528,414			1,293,000	322,556
Idaho			135,630	468,533			7,127		335,164
Illinois	24	941,411	2,943,263	663,963	275,094	322,730	3,294,708	372,000	3,506,928
Indiana		376,597	887,303	244,115	707,989	1,032,651	953,726	324,000	1,434,688
Iowa		447,515	974,129	571,987		76,990	1,275,332	129,000	726,750
Kansas		269,705	765,561	539,656		53,718	817,986		283,461
Kentucky		95,873	342,839		1,118,533	127,255	181,993	129,000	443,039
Louisiana		515,456	436,773	18,313	835,560			54,000	432,785
Maine		92,823	30,140		463,306				407,392
Maryland	344,571	55,429	1,115,022	113,192	342,172			79,000	318,270
Massachusetts	614,786	1,514,986	694,136		1,404,517			19,000	1,157,813
Michigan	20,952	1,667,156	1,695,490	152,925	1,531,087	405,215	442,072	2,076,000	1,668,772
Minnesota		501,608	539,062	222,718			1,633,334	840,000	540,089
Mississippi		275,733	279,137		660,355			411,000	270,326
Missouri		357,033	1,420,146	767,315		153,231	1,899,519		1,539,234
Montana				425,400			2,235		224,108
Nebraska		9,670	517,561	370,998			673,125		125,974
Nevada									157,836
New Hampshire	2,310	18,268	61,981		239,656				194,134
New Jersey	1,036,857	981,998	1,402,189	366,588	1,454,988			473,000	843,077
New Mexico			199,142	446,093	32,586		301,432		68,068
New York	1,358,238	1,744,444	3,472,483	71,169	3,030,195			1,283,000	2,964,058
North Carolina	378,214	176,780	694,887	129,788	1,332,181			803,000	905,660
North Dakota		151,983	112,725	73,250			193,029	127,000	26,030
Ohio	824,214	1,387,094	1,489,098	390	2,562,198	658,909	162,270	2,444,000	2,159,612
Oklahoma		550,797	602,410	1,051,892	50,632	266,428	893,771	140,000	40,497
Oregon				3,724			4,162		1,051,372
Pennsylvania	7,343,812	773,075	2,588,337	31,963	3,380,865		47,037	616,000	342,488
Rhode Island	301,714	78,185	202,227		235,770				139,468

TABLE 22.—*Total domestic sales of gasoline by major oil companies, by States, 1938*—Continued

	Atlantic Refining Co.	Cities Service Co.	Consolidated Oil Corporation	Continental Oil Co.	Gulf Oil Corporation of Pennsylvania	Ohio Oil Co.	Phillips Petroleum Co.	Pure Oil Co.	Shell Union Oil Corporation
South Carolina	120,738	119,824	425,233	36,354	818,270			333,000	379,684
South Dakota		38,983	236,650	108,214			271,222	9,000	49,930
Tennessee		228,732	622,281		1,273,671		116,718	469,000	471,521
Texas	1,190	1,320,854	2,555,504	1,305,982	3,605,326	602,842	708,650	385,000	447,650
Utah			258,681	338,925			842		215,977
Vermont	952	25,451	47,548		192,055				132,550
Virginia	266,214	305,308	519,594	418,679	811,411			361,000	611,481
Washington				115,433			887		1,524,754
West Virginia	71,881	8,807	136,728	12,505	614,530			359,000	102,823
Wisconsin		794,609	889,016	151,047			790,452	428,000	792,365
Wyoming		588	592,308	295,567		13,241	11,433		51,430
Total	13,923,072	17,679,684	33,471,286	11,016,723	32,271,440	3,713,210	15,117,676	15,734,000	35,024,259

	Skelly Oil Co.	Socony-Vacuum Oil Co.	Standard Oil Co. (Indiana)	Standard Oil Co. (New Jersey)	Standard Oil Co. (Ohio)	Sun Oil Co.	Texas Corporation	Tide-Water Associated Oil Co.	Union Oil Co. of California
Alabama			390,793				658,474		
Arizona		202,012	792				373,826	125,658	171,767
Arkansas	24,963	565,993		845,126			320,900	13,306	
California		3,774,053	9				2,420,197	4,821,572	4,475,030
Colorado	278,182	328,640	524,143				713,223		
Connecticut		1,775,633	446,509	742,625		397,914	587,072	901,072	
Delaware		64,095	360,564	220,698		117,211	84,653	16,686	
District of Columbia			629,129	923,204		146,373	407,824	42,017	
Florida			622,431			347,503	914,489		
Georgia			647,493				967,306		
Idaho		176,373	376,133				257,368	175,632	61,318
Illinois	444,578	1,874,306	6,872,219				3,254,131	231,129	
Indiana	15,963	1,106,182	3,560,580		15,596	49,781	1,304,116	157,607	
Iowa	749,617	542,120	2,662,890				622,137	145,437	
Kansas	877,709	989,382	1,303,261				528,189	26,665	
Kentucky			90		56,365	40,164	659,811		
Louisiana		291,270	692,807	1,534,263			709,665	80,759	
Maine		834,085	239,243	214,250		27,536	364,252	555,027	
Maryland			1,287,571	1,518,907		289,742	495,254	293,273	
Massachusetts		3,571,615	1,413,324	1,548,232		740,688	1,501,774	1,305,738	

Michigan	1,716	2,930,485	4,713,010		405,770	2,622,226	1,284,417	5,051	
Minnesota	714,577	719,761	2,540,626				632,009	674,226	
Mississippi			422,232				527,609		
Missouri	607,797	637,998	2,328,492				874,411	172,500	
Montana		128,737	405,537				495,406	2,398	
Nebraska	335,475	468,287	517,538				443,849	6,443	
Nevada		17,677					102,262	65,064	97,861
New Hampshire		513,220	112,552	198,692		60,941	259,304	156,780	
New Jersey		891,612	1,127,044	5,253,167		2,221,904	1,208,096	1,625,736	
New Mexico	9,962	152,137					338,900		
New York		11,033,501	1,379,421	4,683,051		2,838,263	4,612,339	3,348,424	
North Carolina			658,692	2,714,386			1,345,746		
North Dakota	17,191	315,805	917,923				288,218	103,244	
Ohio		1,806,850	335,609		7,284,633	2,221,773	1,421,380		
Oklahoma	288,190	1,251,820	146,100			204,453	869,401	296,120	
Oregon		722,616					488,852	665,931	596,626
Pennsylvania		2,305,419	2,599,057	4,827,083	546,281	3,270,807	1,571,211	1,176,790	
Rhode Island		569,413	323,970	208,592		295,572	210,702	314,779	
South Carolina			226,528	1,337,336			650,313		
South Dakota	81,397	443,367	755,357				299,089	126,985	
Tennessee			321,608	1,705,312			751,732		
Texas	37,900	3,958,158	287,861	2,320,559			4,631,718		
Utah		9,412	1,357,842				213,853	127,834	
Vermont		396,833	121,203	106,661		47,901	215,541	187,698	
Virginia			1,114,793	2,606,365		60,299	1,321,468	37,192	
Washington		1,063,859	52				645,670	680,755	975,277
West Virginia		16,104	421,425	1,680,307	40,226	202,870	211,050		
Wisconsin	350,878	1,571,202	2,750,581				750,485	244,236	
Wyoming	6,582	98,958	349,734				271,113		
Total	4,842,677	48,119,020	48,264,798	35,188,816	8,349,871	15,603,921	44,080,805	18,909,764	6,377,879

Source: Temporary National Economic Committee Questionnaire for Oil Companies. The Standard Oil Co. of California and the Mid-Continent Petroleum Corporation did not answer the committee's questionnaire.

TABLE 23.—*Total gasoline consumption and domestic sales of gasoline by major oil companies, by States, 1938*

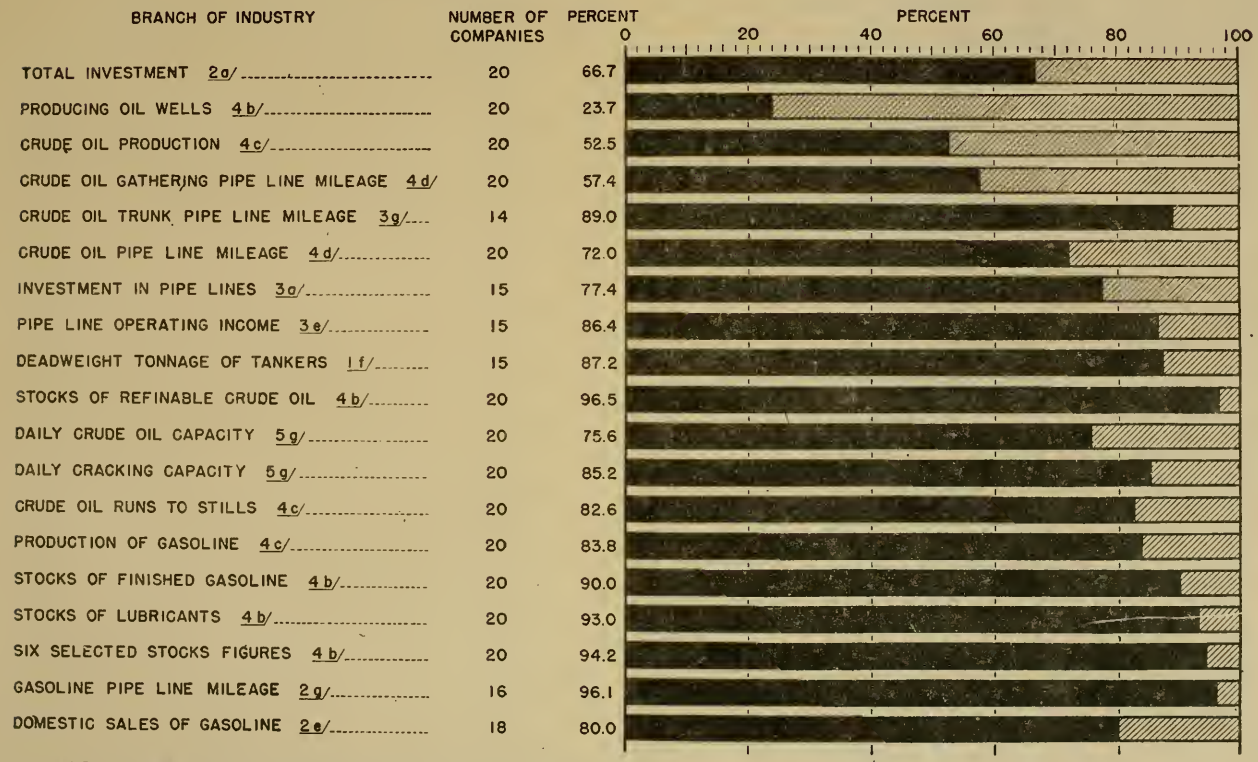
State	Total consumption [1] (1)	Sales by 18 majors [2] (2)	Percent (2) ÷ (1) (3)	Percent principal company (4)	Number of companies (5)
Total	509, 665, 311	407, 688, 901	80. 0	9. 5	18
Alabama	5, 482, 786	3, 673, 794	67. 0	15. 1	8
Arizona	2, 433, 571	1, 380, 372	56. 8	15. 4	7
Arkansas	4, 049, 595	3, 341, 244	82. 5	20. 9	12
California	41, 721, 476	20, 818, 657	49. 9	12. 8	8
Colorado	5, 403, 976	4, 002, 008	74. 1	18. 3	10
Connecticut	7, 606, 286	7, 498, 084	98. 6	23. 3	13
Delaware	1, 322, 905	1, 489, 575	112. 6	27. 3	13
District of Columbia	3, 316, 452	2, 907, 793	87. 7	27. 8	11
Florida	8, 061, 976	6, 137, 683	76. 1	16. 4	10
Georgia	8, 066, 357	6, 058, 229	75. 1	18. 9	9
Idaho	2, 254, 786	1, 993, 278	88. 4	20. 8	9
Illinois	31. 781, 929	24, 996, 484	78. 6	21. 6	14
Indiana	15, 045, 619	12, 170, 894	80. 9	23. 7	15
Iowa	12, 573, 643	8, 923, 904	70. 9	21. 2	12
Kansas	11, 167, 000	6, 455, 293	57. 8	11. 7	11
Kentucky	6, 109, 286	3, 195, 962	52. 3	18. 3	11
Louisiana	5, 899, 286	5, 601, 651	94. 8	26. 0	11
Maine	3, 449, 190	3, 228, 054	93. 6	24. 2	10
Maryland	6, 475, 143	6, 252, 403	96. 5	23. 5	12
Massachusetts	16, 432, 381	15, 486, 609	94. 2	21. 7	12
Michigan	25, 094, 286	21, 022, 374	83. 8	18. 8	16
Minnesota	12, 612, 500	9, 558, 010	75. 8	20. 1	11
Mississippi	4, 615, 762	2, 846, 392	61. 6	14. 3	7
Missouri	14, 372, 833	10, 757, 676	74. 9	16. 2	11
Montana	2, 823, 905	1, 683, 821	59. 6	17. 5	7
Nebraska	5, 489, 381	3, 468, 920	63. 2	12. 3	10
Nevada	948, 024	440, 700	46. 5	16. 6	5
New Hampshire	2, 027, 524	1, 817, 838	89. 7	25. 3	11
New Jersey	19, 748, 214	18, 886, 256	95. 6	26. 6	13
New Mexico	2, 145, 405	1, 548, 320	72. 2	20. 8	8
New York	42, 909, 929	41, 818, 586	97. 4	25. 7	13
North Carolina	9, 546, 405	9, 139, 334	95. 7	28. 4	10
North Dakota	3, 030, 905	2, 326, 398	76. 7	30. 3	11
Ohio	30, 448, 214	24, 758, 030	81. 3	23. 9	14
Oklahoma	9, 564, 452	6, 652, 511	69. 6	13. 1	14
Oregon	5, 468, 690	3, 533, 283	64. 6	19. 2	7
Pennsylvania	33, 418, 714	31, 320, 255	94. 0	22. 0	15
Rhode Island	2, 880, 619	2, 880, 392	100. 0	19. 8	11
South Carolina	4, 656, 143	4, 447, 280	95. 6	28. 7	10
South Dakota	3, 079, 881	2, 420, 194	78. 6	24. 5	11
Tennessee	6, 717, 310	5, 960, 575	88. 7	25. 4	9
Texas	30, 244, 762	22, 169, 194	73. 3	15. 3	14
Utah	2, 208, 786	2, 523, 366	114. 3	61. 5	8
Vermont	1, 531, 500	1, 474, 393	96. 3	25. 9	11
Virginia	8, 456, 048	8, 434, 004	99. 7	30. 8	12
Washington	8, 045, 881	5, 006, 687	62. 2	19. 0	8
West Virginia	4. 532, 119	3, 878, 256	85. 6	37. 1	13
Wisconsin	12, 915, 786	9, 512. 931	73. 7	21. 3	11
Wyoming	1, 477, 690	1, 690, 954	114. 4	40. 1	10

Source:

[1] American Petroleum Institute.
[2] Temporary National Economic Committee Questionnaire for Oil Companies. Standard Oil Co. of California and Mid-Continent Petroleum Corporation did not answer the committee's questionnaire.

CHART XIX

PERCENTAGE OWNERSHIP OR CONTROL BY MAJOR OIL COMPANIES IN VARIOUS BRANCHES OF THE PETROLEUM INDUSTRY



a=DEC. 31, 1938; b=DEC. 31, 1937; c=1937; d=JUNE 30, 1936; e=1938; f=SEPT. 30, 1938; g=JAN. 1, 1938

1. U. S. MARITIME COMMISSION AND PETROLEUM CONSERVATION DIVISION, DEPARTMENT OF THE INTERIOR
2. MOODY'S MANUAL OF INVESTMENTS: TEMPORARY NATIONAL ECONOMIC COMMITTEE QUESTIONNAIRE FOR OIL COMPANIES, AND AMERICAN PETROLEUM INSTITUTE
3. INTERSTATE COMMERCE COMMISSION
4. U. S. BUREAU OF MINES
5. U. S. BUREAU OF MINES. INCLUDES RICHFIELD OIL CORPORATION

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TABLE 24.—*Quantities of gasoline sold in the United States by major oil companies to which tetraethyl lead, purchased from the Ethyl Gasoline Corporation, was added in any quantity for use in blending, by years, 1929–38*

[Thousands of 42-gallon barrels]

Name of company	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Total	310,085	304,434	279,124	249,681	225,101	92,811	26,306	40,480	35,324	22,660
Atlantic Refining Co. (The)	11,732	11,484	10,626	9,830	9,477	2,674	815	1,015	1,444	1,474
Cities Service Co	14,341	14,425	13,264	12,665	9,398	2,068	316	605	152	------
Consolidated Oil Corporation	27,563	27,442	24,760	20,674	18,100	772	1,549	2,237	------	------
Continental Oil Co	8,942	9,112	8,572	8,089	7,824	3,560	592	942	1,104	------
Gulf Oil Corporation of Pennsylvania	29,598	29,048	25,453	22,799	21,845	9,600	2,192	3,799	------	------
Ohio Oil Co. (The)	3,146	3,161	2,890	2,630	2,285	906	255	480	214	26
Phillips Petroleum Co	11,631	11,366	10,476	9,404	8,362	4,172	863	948	500	62
Pure Oil Co. (The)	14,440	15,012	14,488	12,857	10,891	5,271	603	1,052	291	------
Shell Union Oil Corporation	5,052	3,372	4,345	2,073	1,538	1,131	1,929	2,433	------	------
Skelly Oil Co	3,683	3,635	3,520	3,343	2,767	1,374	223	398	137	------
Socony-Vacuum Oil Co	41,168	40,853	38,543	34,004	30,522	18,463	3,817	5,363	6,532	3,310
Standard Oil Co. (Indiana)	27,651	28,434	26,973	23,843	22,273	10,947	4,215	7,662	10,006	7,103
Standard Oil Co. (New Jersey)	40,269	39,011	35,681	32,211	28,175	18,749	4,034	5,925	7,214	5,431
Standard Oil Co. (Ohio)	8,086	7,880	7,222	6,307	6,087	4,499	1,381	2,496	3,246	3,165
Texas Corporation (The)	39,909	39,579	34,912	30,329	27,114	1,442	2,259	3,071	2,066	------
Tidewater Associated Oil Co	17,249	17,026	16,025	14,297	15,341	7,030	1,085	1,633	1,940	1,581
Union Oil Co. of California	5,625	3,594	1,374	4,326	3,102	153	178	421	478	508

Sun Oil Co. states it does not use tetraethyl lead; Standard Oil Co. of California and Mid-Continent Petroleum Corporation did not answer the questionnaire.

Source: The Temporary National Economic Committee Questionnaire for Oil Companies.

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